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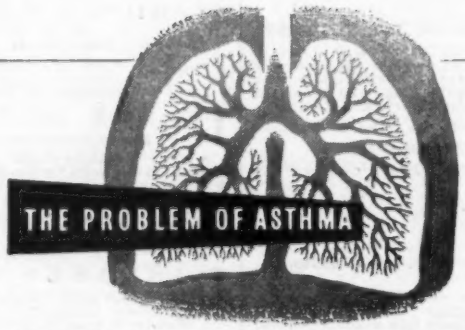

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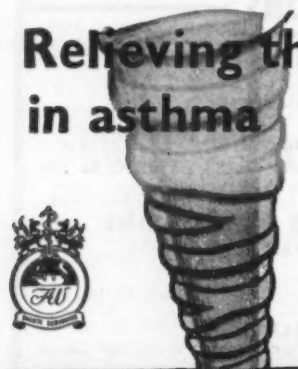

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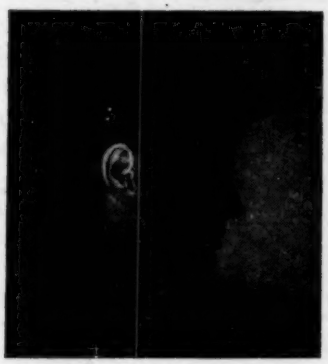
Now, by the use of Cerumol Ear Drops, wax can be removed in most cases at one visit. A few drops of Cerumol can be instilled into the ear and, while another patient is being attended to, the soft cerumen dissolves and the harder wax disimpacts. The wax can then be removed by gentle syringing or with cotton wool. The wax may even be found to run out of the ear on its own accord, in which case patients themselves may instil Cerumol at home, obviating further attendances.

Cerumol is anti-bacterial, non-irritating and harmless to the lining of the external auditory meatus or the tympanic membrane.

Cerumol is included in Category No. 4 of the M.O.H. classified list of Proprietary Preparations and may be prescribed on N.H.S. Form E.C.10.



PACKS:—For Surgery Use: 10 *c.c. vial—separate dropper included. (Basic N.H.S. price* 2/8.) *For Hospital Use:* 2 *oz. and* 10 *oz. bottles.*

CERUMOL Reg. TRADE MARK

EAR DROPS

for the easier removal of wax

Distributors in U.K.

TAMPAX LIMITED, BELVUE ROAD, NORTHOLT, GREENFORD, MIDDLESEX. Tel.: WAXlow 2244

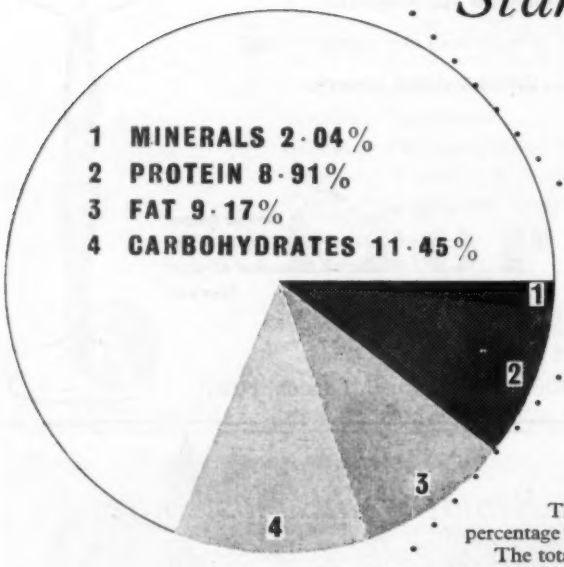
If you wish to test for yourself and have not received recently a 10 *c.c. vial, please write or telephone direct to:*

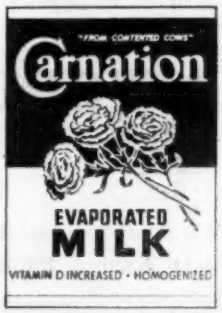
LABORATORIES FOR APPLIED BIOLOGY LTD. · 91, AMHURST PARK · LONDON N.16 · Telephone: STAmford Hill 2252

7

Carnation Milk *for infant feeding*

The advantages of *Standardisation*





The diagram above shows the percentage of solids in Carnation Milk. The total solids are standardised, as required by law, to a minimum of 31%. Of this figure not less than 9% must be butterfat. Previous Carnation advertisements have demonstrated that, chemically and physically, ordinary milks cannot compete with the range of tolerance and digestibility of the proteins and butterfat in Carnation Milk. These superiorities in an infant food are enhanced by the uniformity obtained by standardisation. Uniformity in practice means :—

1. *Constant calorie value.* ***2.*** *Accuracy and ease of measurement.* ***3.*** *Control of intake where necessary.* ***4.*** *Precision in dilution.* ***5.*** *A milk of known value at all times and available everywhere.*

Other attributes of Carnation Milk are:
—Safety, because of sterilisation *after* the Carnation cans are sealed—Hypo-allergenic properties—Homogenisation—Prophylactic D3.

"The Feeding of Infants"—a book specially prepared for doctors together with reprints of clinical investigations and Carnation feeding charts are available from: Medical Dept., General Milk Products Ltd., Bush House, Aldwych, London, W.C.2.

CARNATION MILK "*from Contented Cows*"

Gypsona
TRADE MARK

has stood the test of time

Soaks more readily than hand-rolled bandages.

Sets firmly in four to five minutes.

Stronger yet less brittle than ordinary plaster.

Casts have porcelain-like surface.

Casts are porous.

Trimmed edges do not crumble and casts have a neat appearance.

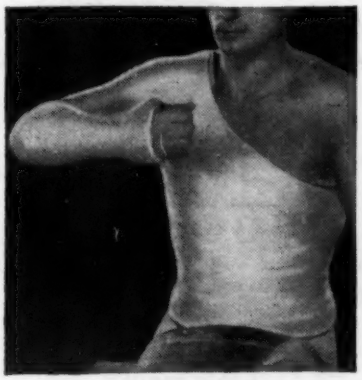
Casts may be bivalved, or cut open and sprung apart without loss of strength.

Exact number of bandages for a particular cast can be determined beforehand.

Special interlocked woven cloth permits easy moulding.

High plaster content—90% of plaster by weight.

Will keep for a very long time without deterioration when stored in a dry place.

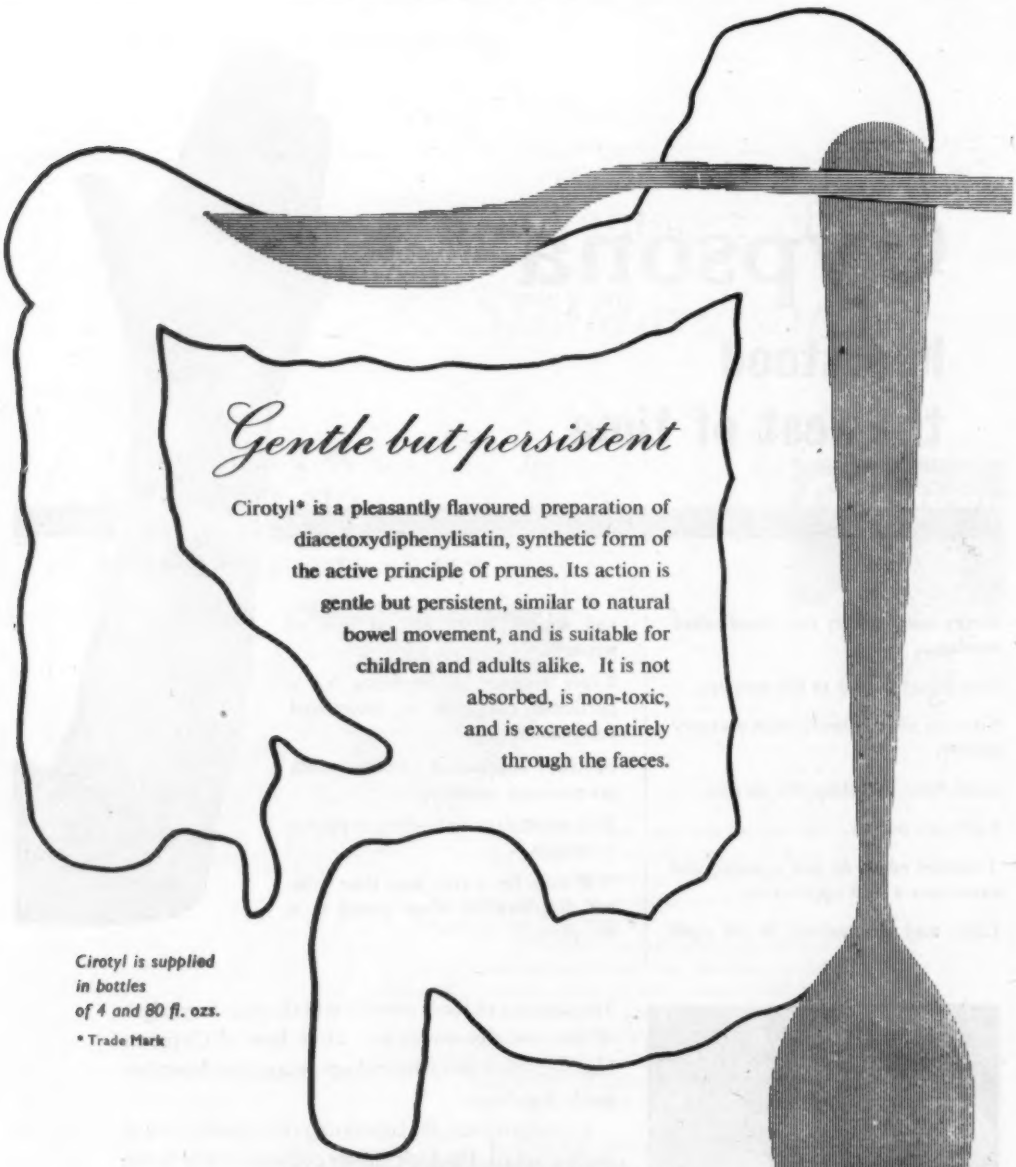


The absence of loose powder and the non-fray edges of the specially-woven leno cloth base of Gypsona bandages provides a distinct advantage over hospital-made bandages.

In performance, the superiority of Gypsona is even more marked. The high plaster content is fixed to the fabric by a special process, and there is a negligible loss of plaster when the bandage is soaked. A surprisingly small amount of material will produce a cast which is light, but of great strength.

Gypsona is by far the most economical plaster for the modern functional treatment of fractures.

SMITH & NEPHEW LTD · WELWYN GARDEN CITY · HERTS 1856 S&N 1956 Gypsona TRADE MARK



Gentle but persistent

Cirotyl* is a pleasantly flavoured preparation of diacetoxydiphenylisatin, synthetic form of the active principle of prunes. Its action is gentle but persistent, similar to natural bowel movement, and is suitable for children and adults alike. It is not absorbed, is non-toxic, and is excreted entirely through the faeces.

Cirotyl is supplied in bottles of 4 and 80 fl. ozs.

* Trade Mark

CIROTYL

contact laxative preparation

PARKE, DAVIS & COMPANY LTD. *(Inc. U.S.A.)* HOUNSLOW • MIDDLESEX • TEL: HOUnslow 2361 720

Aspirin *and* Ulcer

"ASPIRIN is a serious gastric irritant, particularly in peptic ulcer patients."

"Calcium aspirin does not have this irritant action unless it has deteriorated through standing, and it can be used with impunity, especially if prescribed in soluble form. This simple measure would, in our opinion, cut down significantly the incidence of hæmatemesis and exacerbations of ulcer symptoms."

British Medical Journal, July 2nd 1955

SOLPRIN provides calcium aspirin in pure and stable form

CODIS is a compound tablet that provides codeine and phenacetin and calcium aspirin, in place of the ordinary aspirin in Tab. Codein. Co. B.P.

Neither SOLPRIN nor CODIS is advertised to the public

RECKITT & COLMAN LTD., HULL & LONDON (PHARMACEUTICAL DEPT., HULL)

Clearing Congestion...

Catarrh, blocked sinuses, rhinitis—these are the complaints that will cause congestion in your waiting room this winter. Yet, with ARGOTONE Nasal Spray you can clear congestion in patient *and* waiting room—speedily, safely, surely. Combining the acknowledged vaso-constrictor, ephedrine hydrochloride, and the highly efficient antiseptic, silver vitellin, in aqueous isotonic solution, ARGOTONE gives rapid prolonged nasal patency without rebound congestion. ARGOTONE is tasteless, odourless, and does not sting or burn. When used in the handy polythene squeeze bottle, "Ready-Spray", ARGOTONE can be carried in pocket or handbag to clear congestion whenever it's needed.

ARGOTONE

"Ready-Spray"

the nasal spray that keeps catarrh at bay

ARGOTONE "READY-SPRAY" Basic N.H.S. price 2s. 10d. containing 15 cc. Prescribable on Form E.C.10.

ARGOTONE is also available as Nasal Drops in 20 cc. bottle complete with dropper, and in 4 oz. dispensing pack.

Literature and samples gladly on request

RONA LABORATORIES · 12-13 MOLYNEUX STREET · LONDON W.1

VISTER

VISMARA TERAPEUTICI
CASATENOVO (COMO) ITALY

evidence collected over two
years has confirmed the value of

antemovis

anti-haemorrhagic factor of platelets
in controlling bleeding in medical and surgical conditions

available in boxes of 5 ampoules of 5 mg of double sulphate of 5-hydroxytryptamine and creatinine

for intravenous, intramuscular, topical use

Literature on request

13

The esters of NICOTINIC, SALICYLIC and p-AMINOBENZOIC acids bring relief to cases of arthritis and rheumatism

"Thank you, doctor"

IN CASES OF soft-tissue rheumatism, and arthritic disorders, many doctors are tending more and more to regard Transvasin as an indispensable adjuvant to treatment.

For Transvasin is composed of the esters of nicotinic, salicylic and p-aminobenzoic acids. These esters readily pass the skin barrier in therapeutic quantities, and so enable an effective concentration of drugs to be built up where they are needed.*

Transvasin not only induces vasodilation of the skin with a superficial erythema, but also brings about a deep hyperaemia of the underlying tissues. It is non-irritant and can be safely used on delicate skins.

It is now being widely prescribed, with successful clinical results. Since a very small quantity is sufficient for each application, the cost of treatment is extremely low.

**Therapeutische Umschau VIII, 1952, 10, 143.*

Salicylic acid tetrahydrofurfuryl-ester...	14%
Nicotinic acid ethyl-ester.....	2%
Nicotinic acid n-hexyl-ester.....	2%
p-Aminobenzoic acid ethyl-ester.....	2%
Water-miscible cream base ad	100%

Transvasin is available in 1 oz. tubes, basic N.H.S. price 2/6 plus P.T., and is not advertised to the public. Samples and literature will be glady sent on application.

LLOYD-HAMOL LTD

11 Waterloo Place, London, S.W.1. Tel. WHItehall 8654/5/6

Transvasin is the registered trade mark of Lloyd-Hamol Ltd.

The first

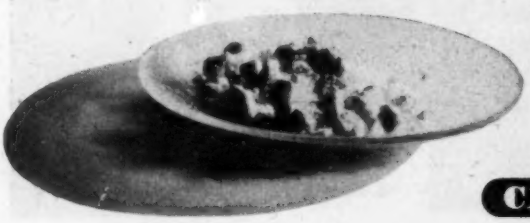
Water soluble

chloramphenicol

By preparing the water-soluble sodium salt of chloramphenicol succinic ester CARLO ERBA have finally solved the therapeutic problem of parenteral (*intramuscular, intravenous, intraspinal*) and topical (*aerosol, intrabronchial, intrapleural*, etc.) administration of this antibiotic.

KEMICETINE

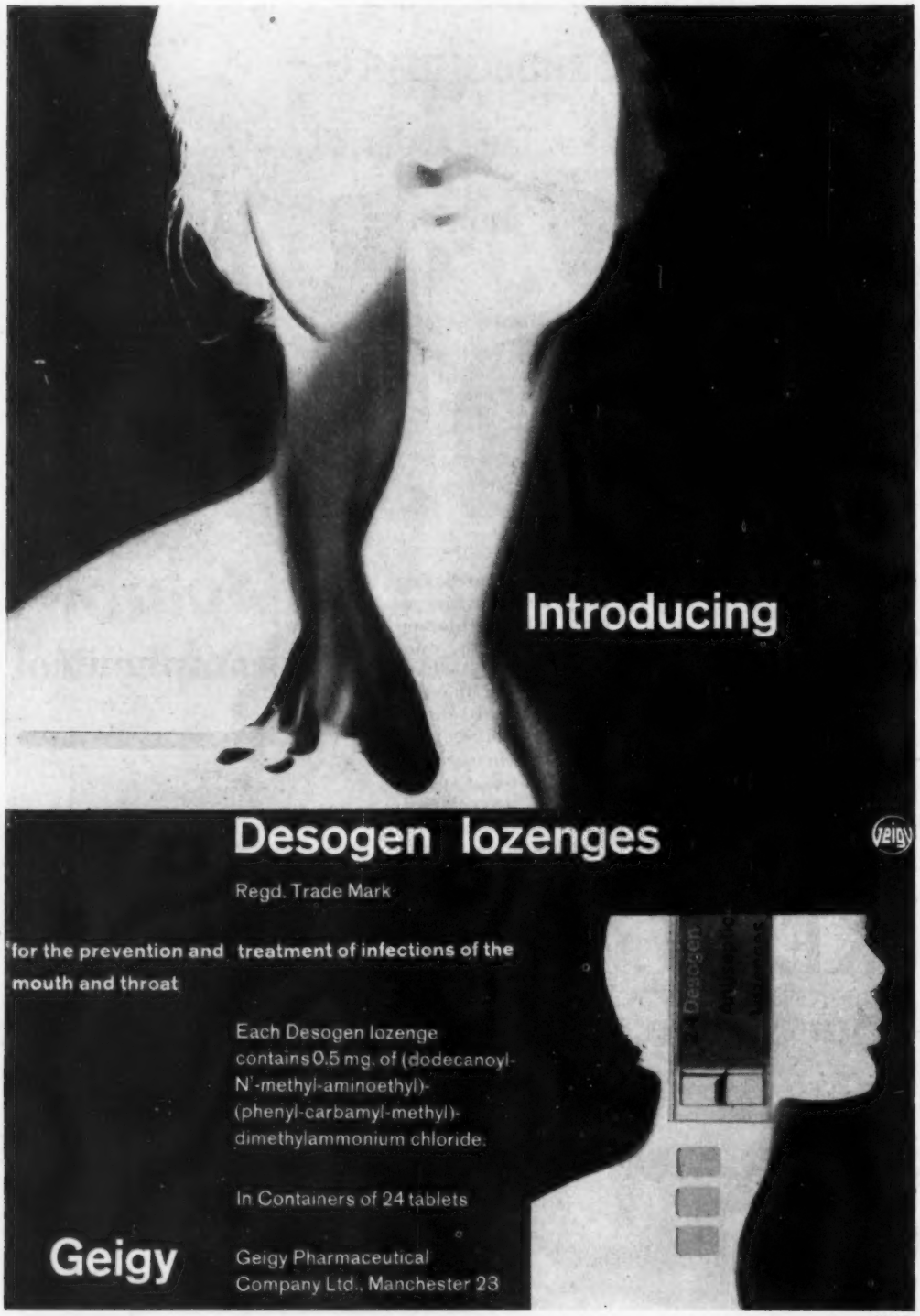
Succinate



CARLO ERBA MILANO

CARLO ERBA MILANO

*B 15


Introducing
Desogen lozenges
Regd. Trade Mark
for the prevention and treatment of infections of the mouth and throat
Each Desogen lozenge contains 0.5 mg. of (dodecanoyl-N'-methyl-aminoethyl)-(phenyl-carbamyl-methyl)-dimethylammonium chloride.
In Containers of 24 tablets
Geigy
Geigy Pharmaceutical Company Ltd., Manchester 23
Desogen
PH.99

THE menopausal patient on 'Premarin' therapy can usually expect a rapid readjustment to her new physiological environment. Outstanding among the advantages of 'Premarin' are the prompt relief of symptoms noted in the majority of cases, and the virtual absence of untoward side effects. Furthermore, the sense of well-being so frequently imparted tends to restore a normal mental outlook.

'Premarin'

an effective natural oestrogen

'Premarin' contains: Oestrone sulphate plus the sulphates of equilin, equilenin, β-oestradiol, β-dihydroequilenin, and other conjugated steroids. *Available as tablets of* 0.625 *mg.* (100 *and* 1,000) *and* 1.25 *mg.* (30, 100 *and* 1,000).

BRIDGING THE DIFFICULT YEARS

Distributed in the U.K. by arrangement with Ayerst, McKenna & Harrison Ltd., Montreal, Canada

BY IMPERIAL CHEMICAL (PHARMACEUTICALS) LIMITED, FULSHAW HALL, WILMSLOW, CHESHIRE

A subsidiary company of Imperial Chemical Industries Limited

Ph.685

17

Napkin Rash

PREVENTION and treatment

DRAPOLENE is a cream formulated specifically for the prophylaxis and treatment of urinary dermatitis.

DRAPOLENE CREAM

PRESCRIBE DRAPOLENE BY NAME

The water miscible property of the cream allows ease of application and facilitates the napkin toilet. The application of DRAPOLENE to both mild and severe forms of urine rash provides a soothing effect which gives relief from the distress associated with all forms of urine rash. Many infant welfare centres confirm that even the severest cases respond satisfactorily in four to six days.

FORMULA

Benzalkonium chloride, 0·01% in a water miscible base.

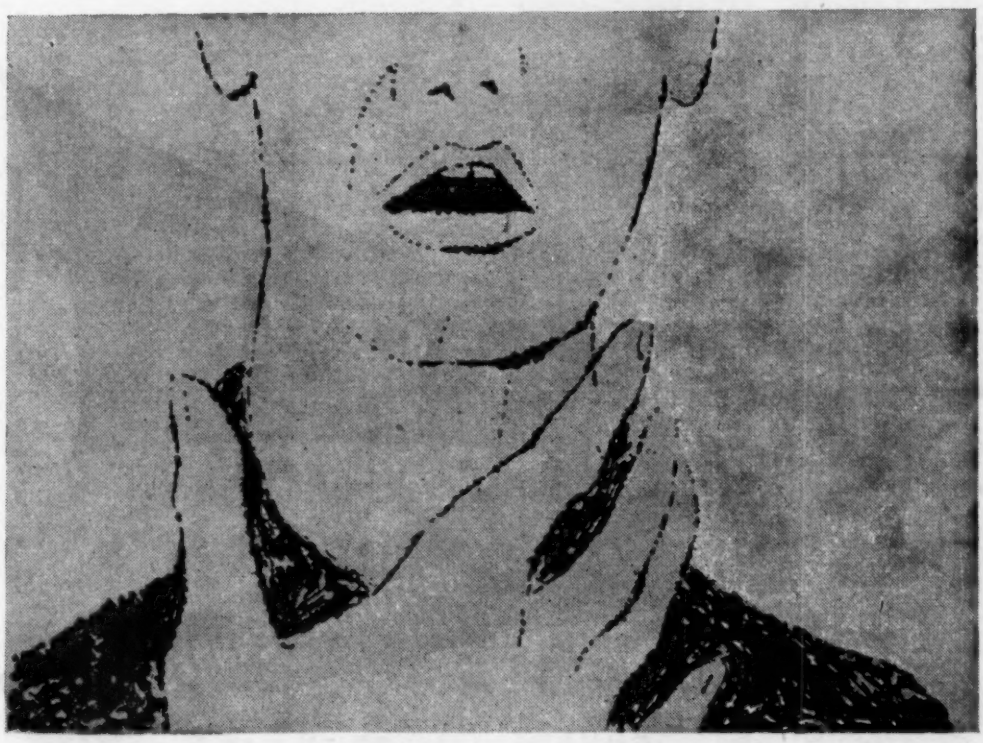
PACKS

2oz. tubes.
1lb. dispensing jars.

CALMIC LIMITED, CREWE. *Phone CREWE 3251-5* **LONDON:** *2 Mansfield St., W.1. Phone LANgham 8038-9*

AUSTRALIA: 458-468 Wattle Street, Ultimo, Sydney, N.S.W. **CANADA:** Terminal Building, York St., Toronto.

D.



always effective

A problem with antibiotics is that resistant strains of micro-organisms tend to develop. Tyrothricin, the antibiotic in Tyrosolven, does not have this drawback.

Produced from strains of B. brevis, tyrothricin is always effective against a wide range of pathogenic bacteria—in fact no pathogenic organisms have been shown to become resistant to it.

This quality, combined with the fact that patients do not become sensitized to tyrothricin, ensures that it will remain a most effective oral antibiotic in cases of stomatitis, tonsillitis, and as a prophylactic against influenza and other throat infections.

Active principles: Tyrothricin 1 mg., benzocaine 5 mg.

Dose: One lozenge every hour till relief is obtained, then 1 lozenge every 3 hours.

Packing: Packs of 20 lozenges. Dispensing bottles of 250 lozenges supplied to chemists.

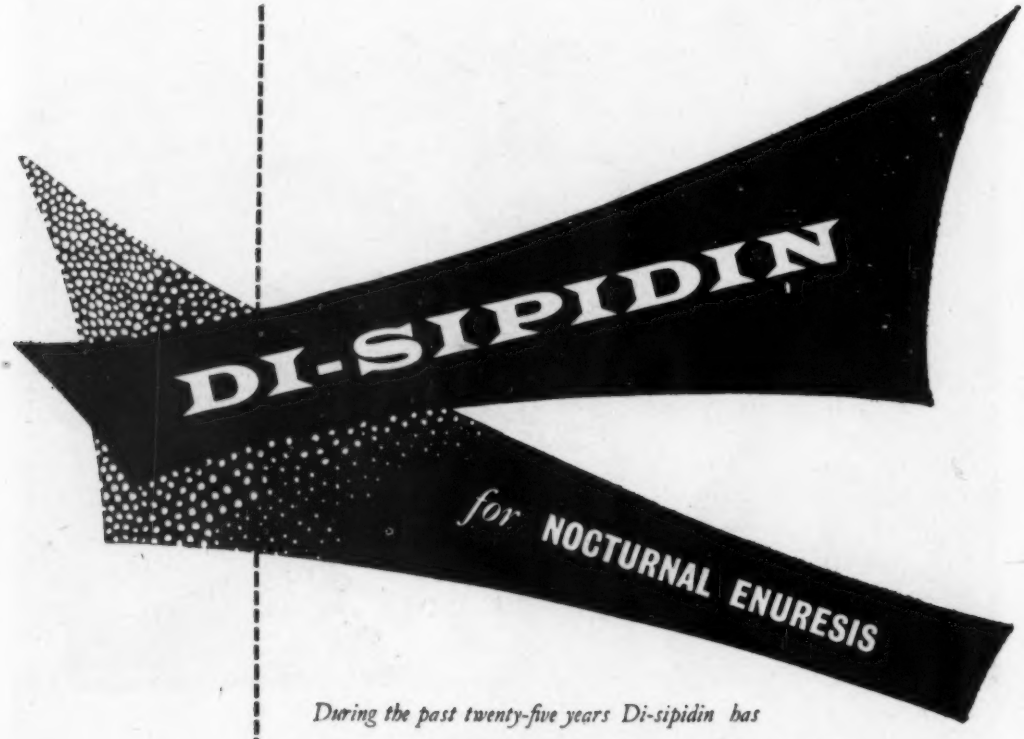
WARNER

Tyrosolven

TRADE MARK

WILLIAM R. WARNER & CO. LTD · POWER ROAD · LONDON, W.4.

19



During the past twenty-five years Di-sipidin has become widely recognised in the treatment of diabetes insipidus and now, recently published clinical trials * *have pointed to its value in the control of adolescent and adult cases of nocturnal enuresis. Di-sipidin is a standardised preparation of the posterior lobe of the pituitary gland, specially made for use by nasal insufflation.*

* *References:* [1] B.M.J. (1954) 11, 1433. [2] (1954) B.M.J. 1, 1038. [3] (1955) B.M.J. 1, 1194.

PAINES & BYRNE LTD.,
PABYRN LABORATORIES,
GREENFORD, MIDDX.

The
ELECTRIC BLANKET in the TUBE

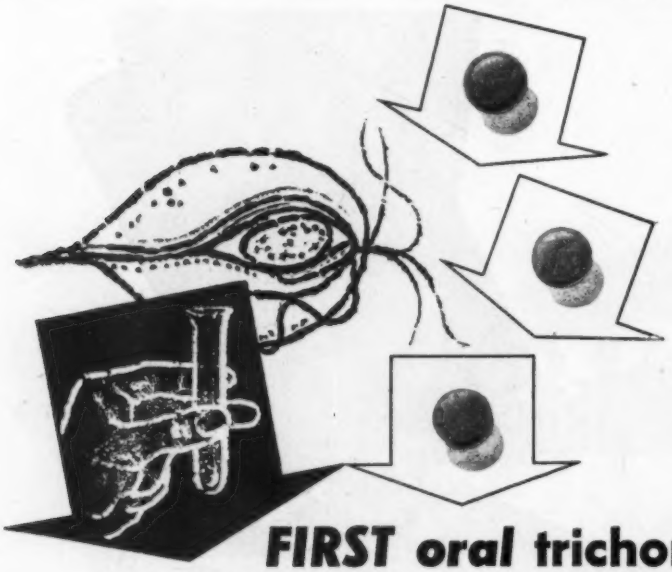
FINALGON Regd. Trade Mark
OINTMENT

Produces a glowing feeling of warmth
which lasts for hours
and relieves rheumatic pain

Tube of 20 g.

COMPOSITION :
Nonylic acid vanillylamide 0.4% and
Nicotinic acid-β-butoxyethyl ester
2.5% in a suitable ointment base
5073/E

LEWIS LABORATORIES LTD., LEEDS 9
21



FIRST oral trichomonacide

TRITHEON*

BRAND OF AMINITROZOLE TABLETS TRADE MARK

for male and female

Because of their systemic action, **TRITHEON** tablets reach resistant trichomonads in their hiding places throughout the genito-urinary tract. Unlike local trichomonacides, **TRITHEON** tablets eradicate the organism in male and female as proved by *negative culture*.

Clinical investigation has demonstrated that **TRITHEON** tablets administered orally eradicate trichomonads for **culture-proved cure** of more than 70 per cent of female patients whose husbands are treated simultaneously with **TRITHEON** tablets. Even when only the wife is treated, cures are effected in approximately one-third of the patients.

Dosage: One tablet three times daily for 10 days

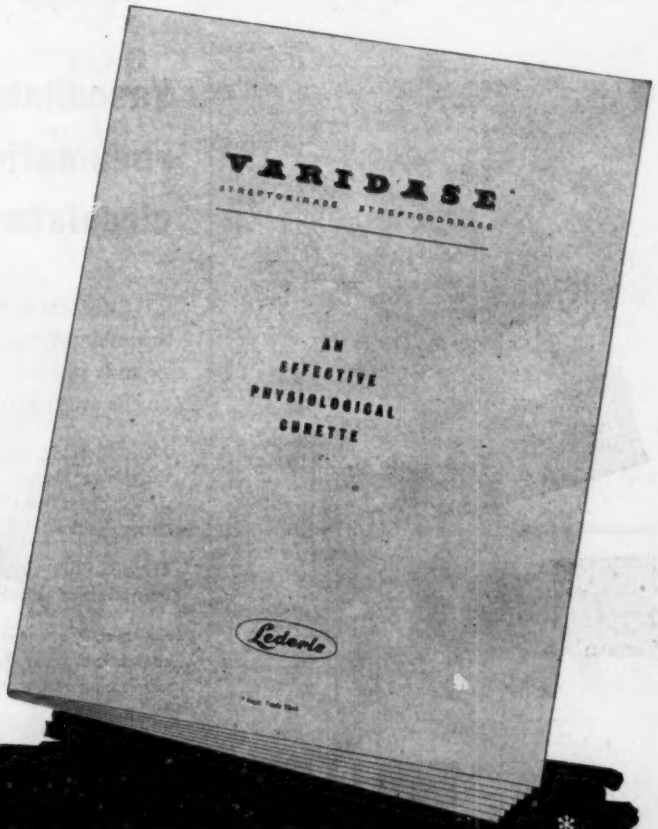
Available: Bottles of 30, 180 and 1000 tablets; each tablet contains 100mg 2-acetylamino-5-nitrothiazole

LITERATURE ON REQUEST

Ortho

Ortho Pharmaceutical Limited • High Wycombe • England

* **TRITHEON** is the original brand of 2-acetylamino-5-nitrothiazole tablets developed in the Ortho Research Foundation for the oral treatment of trichomoniasis



a book that speaks volumes for VARIDASE*

STREPTOKINASE—STREPTODORNASE *REGD. TRADE MARK

dual enzyme solvent of pus and blood clots

Here's a new book that merits a place in every doctor's product file. It explains the powerful solvent action of VARIDASE in liquefying wound and infection coagula . . . shows how the product facilitates drainage and antibiotic access . . . it illustrates dramatically how VARIDASE promotes granulation and new cell formation. The book is concise yet complete. It is intended as a quick reference guide in everyday practice and is available to all doctors and hospitals.

VARIDASE is issued in: *Vial* containing 100,000 units streptokinase and 25,000 units streptodornase
Vial containing 20,000 units streptokinase and 5,000 units streptodornase
Jar of 15 cc. carboxymethylcellulose jelly (for topical applications)

LEDERLE LABORATORIES DIVISION
Cyanamid PRODUCTS LTD. **LONDON, W.C.2.**

23

Vasodilator relief of rheumatic pain and local circulatory disorders

THERMONA, because of its unusually effective formula, produces a surface vasodilatation which extends beyond the area treated. It acts directly on the arterioles.

PERDILATAL (formerly known as Dilatal), a powerful vasodilator which (when given systemically) increases muscle blood flow (1), and also produces a slight increase in cutaneous flow.

Propyl salicylamide, an analgesic more powerful than other derivatives of salicylamide and salicylic acid.

Glycol salicylate and *methyl nicotinate* are often included in analgesic creams. In Thermona they have the function of reinforcing respectively the actions of propyl salicylamide and perdilatal.

FORMULA

PERDILATAL 1- (p-hydroxyphenyl) - 2 - (1' methyl - 3' - phenyl-propylamino) - propanol -(1) hydrochloride	0.3%
Propyl salicylamide	5.0%
Methyl nicotinate	1.0%
Glycol salicylate	10.0%
Vanishing cream base	83.7%

(1) *Lancet*, 1956, **i**, 257.

INDICATIONS

(1) The group of conditions covered by the terms 'muscular rheumatism' and 'fibrositis'.

(2) Local circulatory disorders where they have surface manifestations (e.g., chilblains, Raynaud's disease).

AVAILABILITY

Tubes containing 20 G (approx.) prescribable on N.H.S. form E.C.10.

an S&N product

SMITH & NEPHEW LTD · WELWYN GARDEN CITY · HERTS

Balanced vitamin intake
for young and old

Routine administration of ABIDEC* Drops and Capsules ensures adequate intake of essential vitamins in patients of all ages. Both preparations contain, in well-balanced proportions, seven important fat and water-soluble vitamins for the prevention and correction of dietary deficiencies.

ABIDEC

Abidec Drops provide an easily administered and comprehensive vitamin supplement during infancy and childhood. A single daily dose is adequate.

Abidec Capsules supply in one daily dose of ONE capsule the approximate vitamin requirements of the average adult or adolescent.

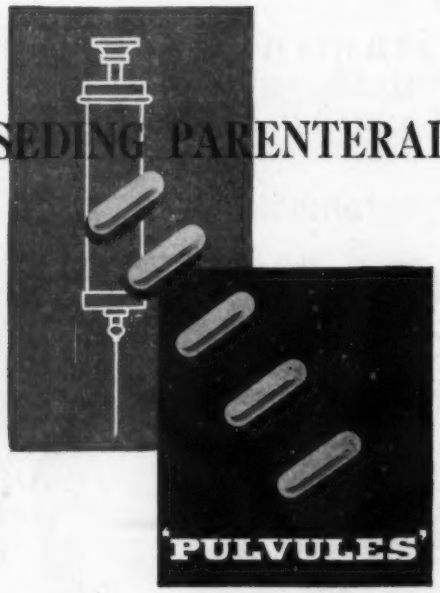
**Trade Mark*

PARKE, DAVIS & COMPANY, LIMITED *(INC. U.S.A.)* HOUNSLOW, MIDDLESEX. *Telephone Hounslow 2361*

64

25

SUPERSEDING PARENTERAL THERAPY



PENICILLIN-V Lilly

THE *effective* **ORAL PENICILLIN**

Reports prove that Penicillin-V will give clinical results comparable with parenteral penicillin. Blood levels are higher and more prolonged than with other oral penicillins. Penicillin-V is unique in that it is unaffected by the action of gastric acid. Whenever penicillin is indicated, Penicillin-V is the product of choice.

The average dose is 125 mg. (200,000 units) four times daily, increased in severe infections.

'PULVULES' PENICILLIN-V, LILLY,
125 mg. (200,000 units)

SUSPENSION PENICILLIN-V LILLY, Paediatric
In bottles to make 60 cc., containing 62.5 mg. (100,000 units) in each large teaspoonful.

TABLETS 'PEN-V-SULPHA'
125 mg. Penicillin-V with 0.5 Gm. Sulphonamides (Sulphadiazine, Sulphamerazine and Sulphadimidine).

Lilly TRADE MARK

ELI LILLY & COMPANY LIMITED
BASINGSTOKE HANTS

26

new

Safe

Effective

Therapy

with '*Hydrocortone*'

in

Nasal Allergy and Rhinitis

'HYDROSPRAY' provides in one convenient form hydrocortisone, 'Propadrin', and neomycin, three agents with specific actions against all the common manifestations of inflammatory and allergic conditions in the nose.
'Propadrin', a vaso-constrictor, reduces congestion and allows better penetration of hydrocortisone and neomycin to the affected sinuses.
Neomycin is desirable for control of existing infection and for prevention of secondary bacterial invasion.
Hydrocortisone exerts its powerful anti-inflammatory and anti-allergic effects where they are most needed.
Steroid side-effects need not be expected.
Relief is immediate.
'HYDROSPRAY' is supplied in a specially designed 15 ml. applicator giving spray or drops as required.

Indications
Hay Fever
Vasomotor Rhinitis
Acute Inflammatory Rhinitis
Chronic Inflammatory Rhinitis
Allergic Rhinitis
Allergic Rhinitis with Polyps

NASAL SUSPENSION

Trade Mark

'*HYDROSPRAY*'

HYDROCORTISONE-'PROPADRIN'-NEOMYCIN

Literature and clinical trial package available to physicians on request.

MSD

MERCK SHARP & DOHME LIMITED, HODDESDON, HERTS.

In two years Becantyl has become an established treatment for useless cough–

Especially with

children and old people,

No side-effects

Unrelated to morphine derivatives or guaiacol and with none of their disadvantages, Becantyl suppresses useless cough. The active ingredient in Becantyl is Sodium-2 : 6-ditertiarybutylnaphthalene monosulphonate. This chemical, which does not cause constipation, anorexia, drowsiness or other side-effects, is the result of original research.

These characteristics make Becantyl especially valuable for the treatment of useless cough in children and old people.

Becantyl is available in 4 fluid-ounce bottles, and also in 40 fluid-ounce and 80 fluid-ounce dispensing bottles.

The suggested doses are:—

Adults: 2 teaspoonfuls

Children: 3—6 years: ½ teaspoonful

7—15 years: ½—1 teaspoonful

three times a day or as prescribed.

Becantyl has no B.P. or N.F. equivalent, is not advertised to the public, and may be prescribed on form E.C.10.

BECANTYL

Literature and Samples available from the Medical Information Department

Horlicks Limited, Pharmaceutical Division, Slough, Bucks

BIBLIOGRAPHY

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Proc. Soc. Exp. Biol. & Med., 1952, **81**, 463

A Propos des Sédatifs de la Toux. *Revue du Praticien*, 1954, No. 7

PENTOXYLON

endows the anginal patient with a happy, useful life...

'Pentoxylon'—combining two effective and reliable agents, 'Rauwiloid' and P.E.T.N. in one tablet—provides a more comprehensive therapy for angina pectoris than has hitherto been possible using a single preparation. 'Rauwiloid'—a purified and standardized alkaloidal extract of *Rauwolfia serpentina*—has pronounced tranquillizing, bradycardic and stress-relieving properties; P.E.T.N. (pentaerythrityltetranitrate) is a powerful, long-lasting coronary vasodilator.

'Pentoxylon' not only relieves the coronary spasm, but helps to *prevent* attacks—reducing the apprehension of the patient living in dread of the next onset of pain, and so checking the cycle at its commencement.

- ✻ *Reduces tachycardia*
- ✻ *Increases exercise tolerance*
- ✻ *Reduces nitroglycerin needs*
- ✻ *Allays apprehension and anxiety*
- ✻ *Lowers blood pressure when this is raised*

RIKER

Each 'Pentoxylon' tablet contains 'Rauwiloid' 1 mg. and P.E.T.N. (pentaerythrityltetranitrate) 10 mg. The usual dose is one tablet four times daily always *before* meals. Up to eight tablets daily are well tolerated.

Descriptive literature will be supplied on request.

'Rauwiloid' and 'Pentoxylon' are registered trade-marks. Regd. Users;

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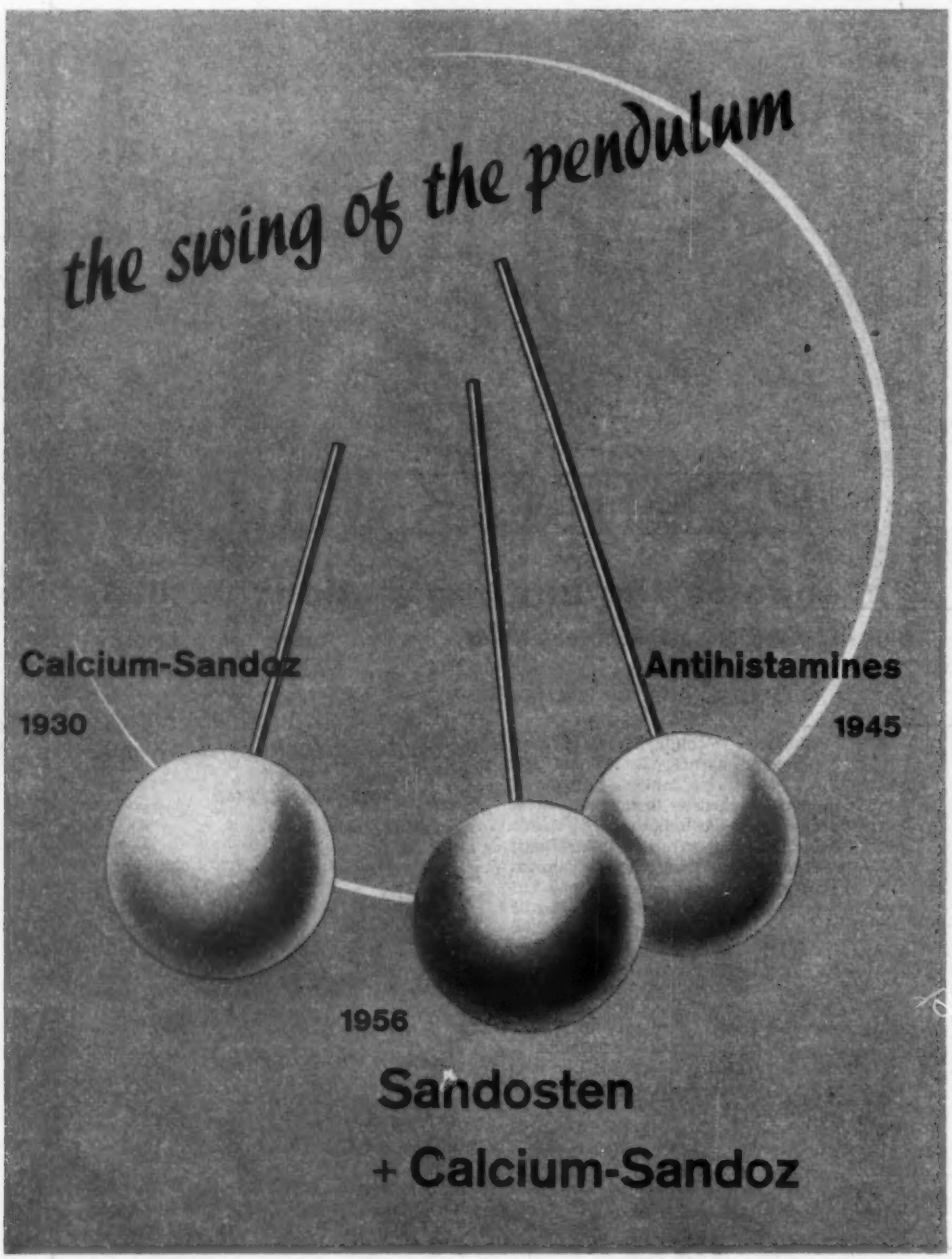

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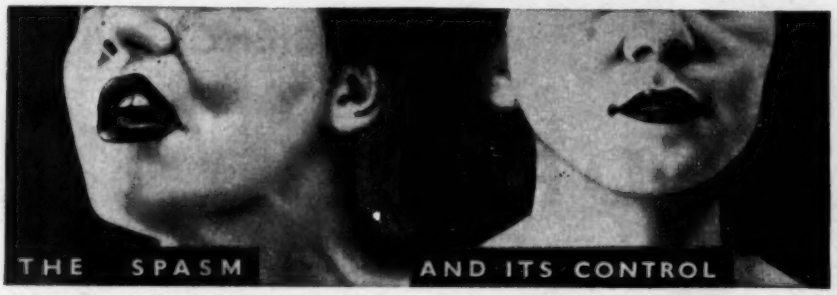

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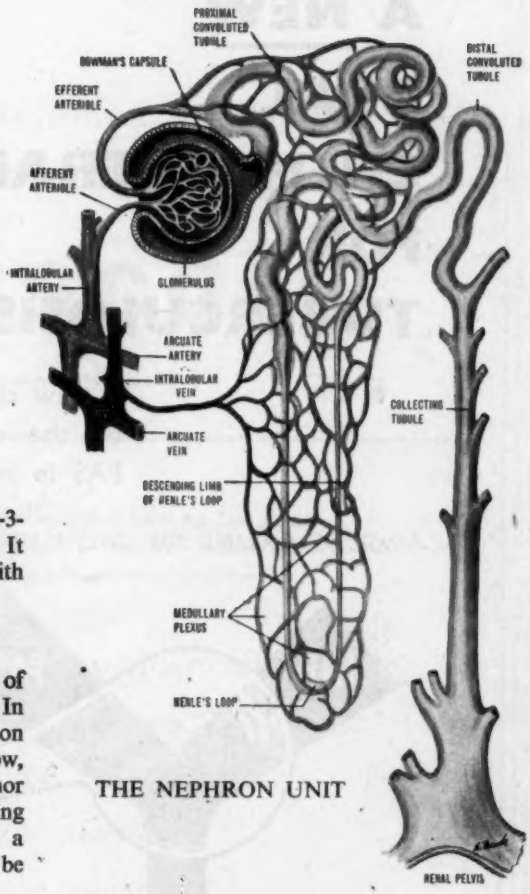

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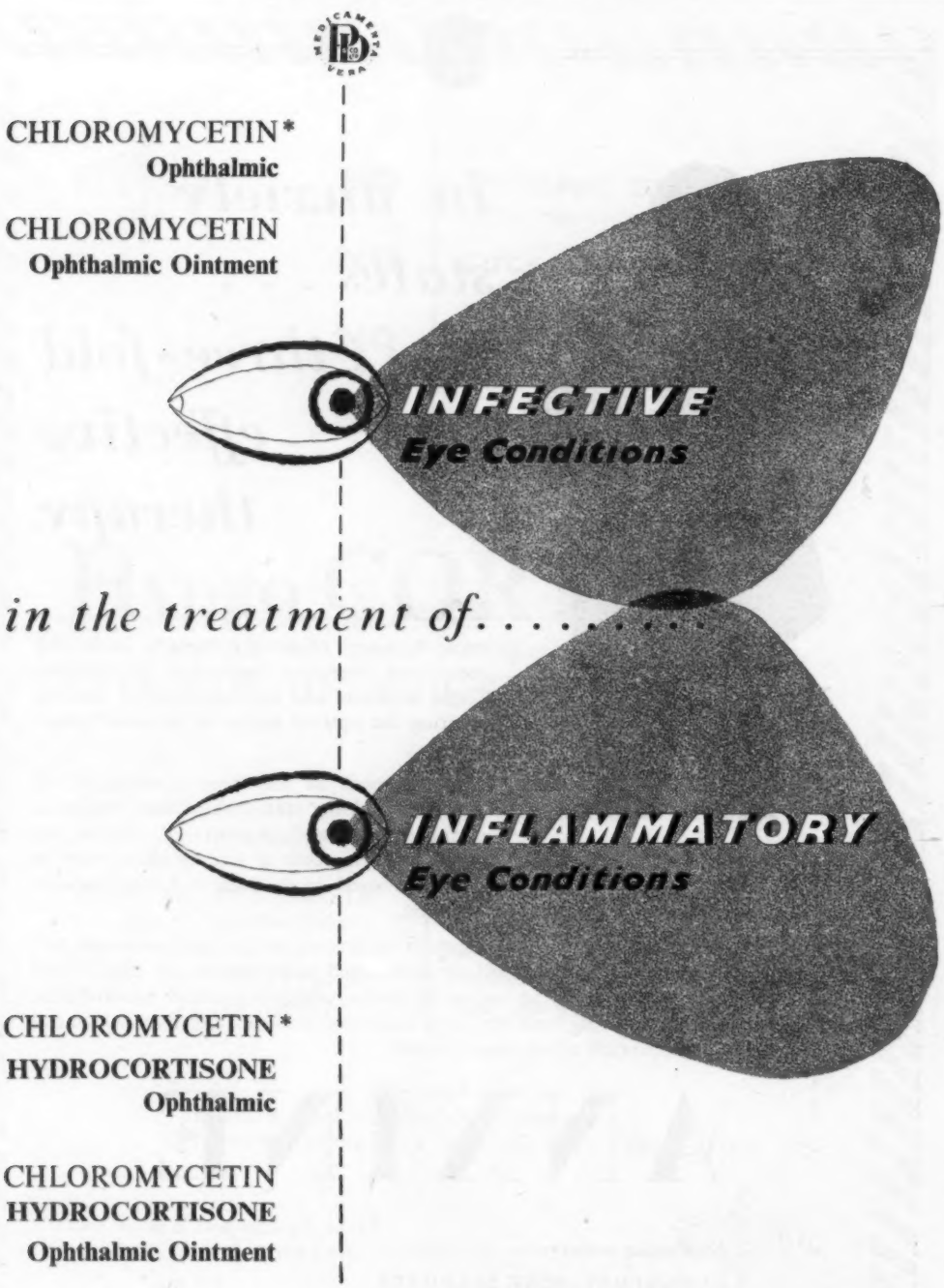

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DOUBTS AND MISGIVINGS ABOUT THE TREATMENT OF DUODENAL ULCER *

ERIC L. FARQUHARSON
M.D. Edin., F.R.C.S., F.R.C.S.E.
SURGEON, ROYAL INFIRMARY OF EDINBURGH

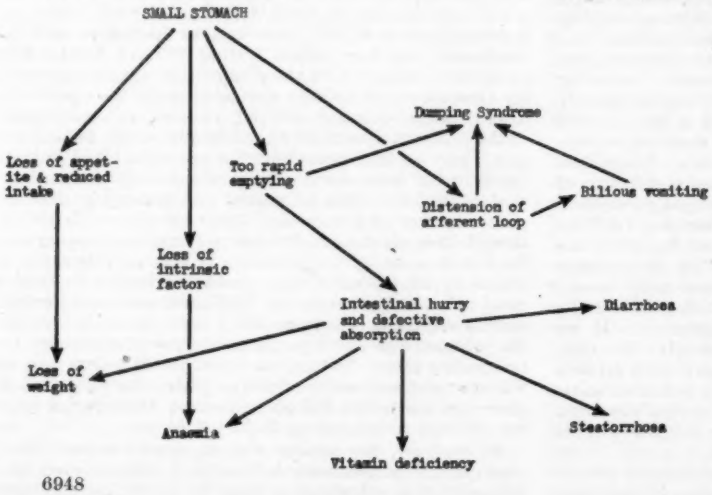
MANY will say that the treatment of duodenal ulcer has now become standardised in the operation of partial gastrectomy, and that this gives good results in the great majority of cases. Nevertheless it is justifiable to ask *how* satisfactory are the results in that majority, and what is the fate of the minority.

The large number of articles published in the past few years indicates a general sense of disquiet about the morbidity that may follow this operation. The patient may be cured of his ulcer but may have exchanged it for a number of postprandial symptoms or for nutritional disturbances, which must be accepted as the direct result of his gastrectomy. Such complications may sometimes leave him unable to maintain his weight and energy or to carry on with his work.

The accompanying diagram indicates how the complications of partial gastrectomy appear to arise in the main from the small size of the remaining gastric segment and from the manner in which it empties. No advances in technique have succeeded in fashioning a new sphincter which will delay gastric emptying; and the rapid entry of food into the jejunum, besides giving rise to a variety of immediate postprandial symptoms (the "dumping" syndrome, bilious vomiting, &c.) seems in some cases to initiate an undue activity of the rest of the alimentary tract.

This condition of intestinal "hurry" can be demonstrated by radiography, especially if glucose is added to the barium meal, which may be shown to reach the hepatic flexure *in five minutes* (Wells 1955). Probably it is initiated simply by too rapid entry of food into the jejunum, this resulting not only from the small size of the gastric remnant but also from the head of pressure within it, since in the upright position the gastric remnant lies directly above the jejunum (Johnson 1954). Whatever its cause, however, it must be accepted as the most probable cause of the various complications, such as diarrhœa, steatorrhœa, vitamin deficiency, anæmia, and loss of weight, which comprise the malabsorption syndrome.

* From a lecture delivered at the Postgraduate Medical School of London on March 9, 1956.



Recurrent ulceration after partial gastrectomy for duodenal ulcer is stated to occur in less than 5% of cases. It is generally ascribed to "inadequate" resection—i.e., less than 70%—or to failure to remove the pyloric antrum (or at least its mucosa), which produces the hormone gastrin. But the fact that this hormone, acting through the blood-stream, can stimulate acid secretion in the remaining segment of stomach shows conclusively that such activity is still inherently present—i.e., all the oxyntic cells cannot have been removed. The stomach has a huge physiological capacity to secrete acid, and the stimulus for such secretion is derived from numerous sources. Babkin (1944) has shown that the acid-secreting cells, although grouped chiefly in the body of the stomach, are distributed over the entire gastric mucosa except the antrum, and that the density of such cells in the cardiac and fundic areas is fully half of that in the body of the stomach. Although, by the standard partial gastrectomy, the main or only source of gastrin may be abolished, the remaining cells may only await some unknown stimulus from another source. In other words, there is no guarantee, even with the most radical subtotal gastrectomy, that the hypochlorhydria will be permanent. Prof. John Bruce has told me of some investigations made in his unit at the Western General Hospital, Edinburgh, in cases of recurrent ulceration after partial gastrectomy: in such cases the acid values of the secretion in the gastric remnant were as much as four times as high as those obtained from a normal stomach. If this work is confirmed, it shows conclusively that the capacity for acid secretion, even to an abnormally high level, can be fully recovered by the remaining segment of the stomach. This would be a very serious indictment of partial gastrectomy.

The problem of the prevention of post-gastrectomy complications is largely unsolved. There is fairly general agreement (Pulvertaft 1952, Capper and Welbourn 1955) that the incidence of *all* complications—except recurrent ulceration—varies directly with the amount of stomach removed. The surgeon, in planning the extent of his resection, has therefore to steer his course between the Scylla of recurrent ulceration and the Charybdis of complications which may arise from a small gastric remnant. The merits of gastroduodenal and gastrojejunal anastomosis after partial gastrectomy, and of the numerous variants of the latter, are the subject of seemingly unending controversy, and the published results do not prove the superiority of any one method. There is evidence that, though digestive disturbances are less frequent, less severe, and less persistent after the Billroth operation than after the Polya, the incidence of recurrent ulcer is greater (Goligher et al. 1956). The supporters of the antecolic and retrocolic methods of gastrojejunal anastomosis are opposed in about equal strength, and those who attempt to fashion "valves" at the site of anastomosis are almost ready to admit defeat.

For the treatment of complications after partial gastrectomy there are no specific dietary or medicinal measures. Often one can do little for the patient except to express an optimism that one does not really feel, and to assure him, *splendide mendax*, that his symptoms can be expected to clear up spontaneously within a short time. All authorities are agreed (Capper and Welbourn 1955) that further operation should be considered only when symptoms are severe and disabling and have persisted

for at least eighteen months after operation. A number of operations have been advocated and practised for the relief of such symptoms, but their results are not very encouraging. Probably the one which has had most success in the case of a previous Polya anastomosis is to convert this into a Billroth I. This procedure, although effective in a fair proportion of cases, does not appear to be logically sound. The various syndromes which it is designed to correct cannot be due merely to short-circuiting of the duodenum, since such syndromes are very rare after gastrojejunostomy, where an essentially similar type of short-circuit is present. The empirical basis on which such a conversion is founded is shown by the fact that the treatment often advised for digestive symptoms after a Billroth-I operation is to convert this into a Polya !

Gastrojejunostomy and Vagotomy

Opinions are sharply divided as to the benefits conferred by this operation. Many say that the operation has been tried and found wanting, their verdicts being based on (1) the prevalence of gastric stasis and retention in the immediate postoperative period ; (2) failure of the original ulcer to heal, or the development either of a gastric ulcer or of a stomal ulcer in relation to the gastrojejunostomy ; and (3) certain late effects of the vagotomy which mar a proportion of the results and may outweigh the curative effect on the ulcer.

In my own experience, vagotomy and gastrojejunostomy has proved very satisfactory as regards the immediate or early results, and I personally regard it as easier and safer than partial gastrectomy for the average case of duodenal ulcer, especially if the ulcer is adherent to surrounding structures, but it is certainly a method of treatment which is still in the experimental stage. Many of the successes may result from the gastrojejunostomy alone—an operation which gave great satisfaction in past years—and the vagal resection carries some disadvantages which are peculiarly its own. We cannot say at present whether such ill effects, slight though they may be, are likely to be temporary or permanent ; nor do we know what other complications may arise in later years from the denervation of such a large part of the alimentary tract.

Gastrojejunostomy Alone ?

It has been stated by some of those who condemn vagotomy (Walters and Belding 1951) that it adds nothing to a simple gastrojejunostomy except a train of its own ill effects. The wheel has now turned full circle, and I think we should consider what gastrojejunostomy by itself may have to offer the duodenal-ulcer patient.

During the first two decades of this century few surgeons cared to dispute the statement made by Moynihan (1908) that no operation was more completely satisfactory than gastrojejunostomy, and as late as 1925 Sherren said that it had done more than any other operation for the good of the human race. Since then gastrojejunostomy has fallen into disrepute because of its alleged liability to be followed by stomal ulceration. This was described in former times (Paterson 1909) as casting no more than a faint shadow over the otherwise admirable results of the operation. With the passing years, however, this shadow has become more dense : indeed it has become a spectre ; and I suggest that its proportions have been seriously exaggerated. If we accept that stomal ulceration is virtually the only complication after gastrojejunostomy (as indeed I think it is), our assessment of the value of the operation must turn on the frequency with which a stomal ulcer develops, and I personally have still to be convinced that that is sufficient to constitute a grave objection.

The accompanying table shows the incidence of stomal ulcer recorded between 20 and 30 years ago in four very large series of duodenal ulcer treated by gastrojejunostomy.

STOMAL ULCER AFTER GASTROJEJUNOSTOMY

Reference	No. of gastrojejunostomies	No. of stomal ulcers
Luff (1929)	744	21 (2·8%)
Balfour (1929)	491	16 (3·3%)
Benedict (1933)	732	21 (2·9%)
Walton (1934)	893	29 (3·2%)
Wright (1935)	2310	93 (4·0%)
Total	5170	180 (3·5% average)

The results of the collective investigations made by the British Medical Association (Luff 1929) and by the Association of Surgeons (Wright 1935) deserve special respect, for they represent the work of many surgeons in all parts of the country, and must therefore be accepted as a fair indication of the value of the operation at that time, in the hands of the surgical community as a whole. The period of follow-up in these two series was 4–8 years and 4–10 years respectively.

If we believe, as many do, that the incidence of stomal ulcer after gastrojejunostomy is much higher than that recorded in these series, either we must hold that the period of follow-up was inadequate, or we must admit that we cannot get such results nowadays. It is well known that stomal ulceration may appear many years after a gastrojejunostomy, but the same is equally true after partial gastrectomy, and even a 10-year or a 15-year follow-up cannot give the final answer. We can, I think, be accused of some complacency if we are content simply to admit that we cannot now achieve the good results that were commonplace after this operation in former years. Has the gastric juice become more powerful ? Has the resistance of the jejunum to that secretion diminished ? Or are we perhaps guilty of some errors in the operative technique, which was laid down so meticulously by our predecessors ?

It is frequently stated that the incidence of stomal ulceration after gastrojejunostomy for duodenal ulcer approaches 30%, 40%, or even 50% ; but in support of such statements there is no statistical evidence from any large series of cases comparable with those recorded 25 years ago.

Let us accept—but only for the purpose of argument—that the incidence of stomal ulcer is 10%, 15%, or even 20%, and then let us assess the position of a patient who has acquired such an ulcer. 20 years ago this was a very serious complication, for Wright (1935) recorded a mortality-rate of 28% from various operations used in treatment, together with a further 12% of deaths due to the ulcer itself. Now the position has entirely altered, for treatment has become standardised in the operation of partial gastrectomy, and the necessary reconstruction of the jejunum does not add materially to the difficulties or dangers of the operation. Tanner (1954) had only 1 death in 107 cases—a mortality-rate actually lower than that which he records for partial gastrectomy in uncomplicated cases of gastric and duodenal ulcer. In short, stomal ulcer after a simple gastrojejunostomy appears to have lost most of its terrors. It has now become a relatively simple condition, readily amenable to treatment by partial gastrectomy. The development of further stomal ulceration is comparatively rare—possibly because the jejunum has developed some degree of immunity to the gastric juice. Indeed, as Wells (1955) points out, it was the excellent results of partial gastrectomy for stomal ulcer that converted British surgeons to this operation as the primary treatment of duodenal ulcer.

By contrast, the patient who acquires a stomal ulcer after partial gastrectomy is in a very different position. Although this complication may be much less common

than it is after gastrojejunostomy, I suggest that it is incomparably more serious, for we have little to offer the patient except the doubtful benefits of a still higher gastrectomy or a vagal resection.

The operation of partial gastrectomy for duodenal ulcer may well be successful in more than 80% of cases, in that it cures the ulcer and is not followed by any ill effects attributable to the resection. But the Bassini operation for inguinal hernia has been roundly condemned because it may achieve no greater success than that. And yet, the patient with a recurrent inguinal hernia after a Bassini repair is in a much more enviable position than the patient with a failed gastrectomy; for the former, unlike the latter, is by no means an irrevocable procedure.

There are, without doubt, innumerable (and forgotten) successes of gastrojejunostomy to be encountered today. In my experience it is quite common to meet elderly patients (often old men with enlarged prostates) who, when questioned about an abdominal scar, state that they had a short-circuiting operation on the stomach 30 or 40 years ago, and that they have since had no digestive troubles whatever. During my training years I was privileged to work with two surgeons who used gastrojejunostomy as the routine treatment for duodenal ulcer, and my experiences with this operation were very happy—happier, I feel, than they have been with partial gastrectomy—for I too have swum with the tide. Cases of stomal ulceration within 5 to 10 years of the operation were few and far between, nor did this complication appear to develop in later years. I say this because, contrary to some opinions, I think that patients in general tend to return to the same surgeon or to his successors in the unit if symptoms recur. During the past 5 years I have operated on only three cases of stomal ulcer after gastrojejunostomy. All these patients were treated by partial gastrectomy, which presented no special problems, and all have remained free from symptoms for 5, 4, and 2 years. One was a man, aged 69, who had had his gastrojejunostomy performed 34 years previously; he had since had no digestive symptoms whatsoever and regarded the operation as an unqualified success—until he suddenly suffered perforation of a stomal ulcer while playing golf. The other two cases also had had complete freedom from symptoms for many years. During the same period I have operated on 18 patients for complications after partial gastrectomy—2 for blown duodenal stump, 1 for subphrenic abscess, 3 for obstruction (1 early and 2 late), 5 for the dumping syndrome, and 7 for recurrent ulcer or hæmorrhage.

Conclusions

Some at least must agree with me in having serious doubts and misgivings that such an irrevocable and seemingly mutilating operation as partial gastrectomy should be accepted as the standard treatment of duodenal ulcer today. I recall with sympathy and with respect the remark made by a famous physician in the early 1930s: "If any surgeon wanted to remove four-fifths of my normal stomach to cure a small ulcer of my duodenum, I would run faster than he." It is, I feel, a sad reflection on the medicine and surgery of our time that we should have to accept removal of the greater part of the healthy stomach as the best available method of reducing its acid secretion, and I wonder whether, in future years, this era will be looked back on as the dark age of gastric surgery. I regret that gastrojejunostomy—an operation which gave so much satisfaction for so many years—should now be relegated to such a lowly place, and that Ogilvie (1956) should have damned it with the faintest praise of all by saying: "For the unskilled surgeon on the unfit patient, it has much to recommend it."

In the face of such damning criticism, and against the weight of widely held opinion, no surgeon today can venture to perform a simple gastrojejunostomy (except on the very ill or feeble patient) without feeling that it may be held as a serious reflection on his judgment or operative skill; and I would be a bold man indeed if I were to advocate unreservedly a return to this operation. Yet, if we ourselves were the patients and had the surgical knowledge to balance the risks involved, would we cheerfully sacrifice three-quarters of our stomachs to reduce the risks of recurrent ulcer to 3% or 4%? Or would we be prepared to accept a higher risk of this complication in return for the privilege of retaining our stomachs. If I were to develop a duodenal ulcer resistant to medical treatment, such are my misgivings at present about gastrectomy that I think I would try to persuade my old chief to emerge from his retirement, to perform upon me a simple gastrojejunostomy, and to allow me to take my chance of a stomal ulcer.

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INCIDENCE OF PREVIOUS TYPE-II INFECTION IN PATIENTS WITH TYPE-I PARALYTIC POLIOMYELITIS

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NATIONAL FUND FOR POLIOMYELITIS RESEARCH

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IN 1951 the Committee on Typing of the National Foundation for Infantile Paralysis demonstrated that all the strains of poliomyelitis virus that were studied from various parts of the world fell into three immunological types, which are now referred to as types I, II, and III. Of the three types, type-I poliovirus is responsible for the majority of cases of paralytic poliomyelitis.

In the past few years a considerable amount of evidence has shown that the possession of antibody which has developed as a result of infection with one type of poliovirus does not prevent subsequent *infection* with one or both of the remaining types. It is nevertheless possible that past infection with one type of poliovirus may reduce the chances of a *paralytic infection* when a second type of poliovirus is encountered.

The object of the present study was to find out whether the possession of type-II antibody gives people any protection against paralytic disease when they are infected with type-I virus. To do this a comparison was made in Northern Ireland between the incidence of past type-II infection (1) among patients with paralytic poliomyelitis caused by type-I virus and (2) among the general population of the same age. If relatively few of the patients with type-I paralytic poliomyelitis had type-II antibody before their paralytic infection this would suggest

that infection with type-II virus gives some protection against a *paralytic infection* with type-I virus.

Materials and Methods

Sera were stored at −20°C and inactivated at 56°C for thirty minutes before testing.

Fæcal specimens were stored at −20°C.

Tissue-cultures were second-pass monkey-kidney-cell monolayers in roller tubes. Lactalbumin-hydrolysate medium was used as described by Melnick (1955).

Virus strains used were type I, Brunhilde; type II, Y-SK; type III, Leon.

Tissue-culture Neutralisation Test.—Sera were tested at the stated dilutions against 100 TCD_{50} of virus. Details of tissue-culture preparation and the neutralisation test were as previously described (Dane et al. 1956).

Virus Isolation from Fæcal Specimens.—Specimens were first screened for the presence of virus by dipping a glass rod into the fæces and then making a small smear of fæces with the rod on the inside of a tissue-culture tube at the level of the cell monolayer. Two or three tubes were set up for each specimen. If no virus was isolated by this method, a 20% fæcal suspension in tissue-culture medium was centrifuged at 4000 r.p.m. for half an hour, and 0·5 ml. of the supernatant fluid was inoculated into each of two tissue-culture tubes from which the medium had been removed. The tubes were rolled for half an hour, and then the fæcal suspension was removed and fresh medium added. If this method was unsuccessful it was repeated with a 20% fæcal suspension which had been concentrated 10X in a 'Spinco' ultracentrifuge. The medium used in isolation tubes contained 1000 units of penicillin and 1 mg. of streptomycin per ml. Cultures were examined microscopically daily for eight days.

Typing of Viruses.—Viruses were typed by the neutralisation test with tissue-culture supernatant fluid from the second passage of the isolated virus at a dilution of 1 in 1000 and type-specific hyperimmune serum at 20 times its titre against 100 TCD_{50} of homologous-type virus.

Results

Between October, 1955, and March, 1956, specimens were received from 29 patients with paralytic poliomyelitis in Northern Ireland, and from 28 of them strains of poliovirus were isolated and typed. The patient from whom virus was not isolated has been excluded from the present series. Type-I poliovirus was recovered from the stools of 26 patients and type-II virus from the stools of the remaining 2. 24 of these isolations were made by the direct fæcal-smear method, usually from the first specimen tested. Two strains were recovered from 20% fæcal suspensions, and the remaining one was only recovered after concentrating the fæcal suspension in an ultracentrifuge.

TABLE I—VIRUS ISOLATION AND SERUM-NEUTRALISATION TESTS IN TWENTY-EIGHT CASES OF PARALYTIC POLIOMYELITIS

Case no.	Age (yr.)	Type of poliovirus isolated	Neutralisation test: Acute serum: Type I	Acute serum: Type II	Acute serum: Type III	Late convalescent serum: Month taken	Late convalescent serum: Type I	Late convalescent serum: Type II	Late convalescent serum: Type III	Presumed antibody pattern before paralytic infection (type) I	II	III
1	7	I	+*	−†	−	..	..	..	..	−	−	−
2	2	I	+	−	−	..	..	..	..	−	−	−
3	1	I	+	−	−	..	..	..	..	−	−	−
4	41	I	+	−	−	..	..	..	..	−	−	−
5	1	I	+	−	−	..	..	..	..	−	−	−
6	3	I	..	..	..	5th	+	−	−	−	−	−
7	8	I	+	−	−	..	..	..	..	−	−	−
8	7	I	..	..	..	5th	+	−	−	−	−	−
9	2	I	+	−	−	..	..	..	..	−	−	−
10	4	I	+	−	−	..	..	..	..	−	−	−
11	3	I	+	−	−	..	..	..	..	−	−	−
12	3	I	+	−	−	..	..	..	..	−	−	−
13	1	I	+	−	−	..	..	..	..	−	−	−
14	1	I	+	−	−	..	..	..	..	−	−	−
15	3	I	+	−	−	..	..	..	..	−	−	−
16	42	I	+	−	−	..	..	..	..	−	−	−
17	7	I	+	−	−	..	..	..	..	−	−	−
18	9/12	I	+	−	−	..	..	..	..	−	−	−
19	11	I	+	−	>64	..	..	..	..	−	−	+
20	2	I	+	4	−	5th	>64	−	−	−	−	−
21	6	I	+	4	−	4th	>64	−	−	−	−	−
22	1	I	+	4	+	6th	>64	−	>64	−	−	+
23	8	I	+	6	+	6th	>64	−	64	−	−	+
24	19	I	+	6	+	4th	>64	−	>64	−	−	+
25	12	I	+	32	>64	6th	>64	4	>64	−	−	+
26	6	I	+	>64	32	6th	>64	64	−	−	+	−
27	9/12	II	−	+	−	..	..	..	..	−	−	−
28	11	II	−	+	−	..	..	..	..	−	−	−

* + = greater than 1 in 4.
† − = less than 1 in 4.

TABLE II—PERCENTAGE OF CHILDREN AGED 1–5 YEARS IN NORTHERN IRELAND WITH ANTIBODY TO TYPE-II POLIOVIRUS (Dane et al. 1956)

Age (yr.)	Under 1	1	2	3	4	5
% with type-II antibody	Not tested	5	37	51	60	77

Sera taken during the acute stage of the illness were tested for neutralising antibody at a 1 in 4 dilution against 100 TCD_{50} of each of the three types of poliovirus. All the patients were found to have antibody to the homologous infecting type of virus. The 2 patients excreting type-II virus had type-II antibody only. Of the 26 patients who were excreting type-I virus and had type-I antibody 7 also had type-II antibody and 6 type-III antibody (see table I).

Titrations of the sera for type-I antibody in these patients showed that only case 26 (see table) had type-II antibody in high titre, and neutralisation tests on paired sera from the acute and early convalescent stages of the disease revealed no change in the levels of the type-II antibody in any of the patients' sera. However, since Sabin (1952) had described a temporary appearance of type-II (Lansing) neutralising antibodies in the serum of patients with type-I paralytic poliomyelitis, it seemed possible that a more accurate picture of the antibody pattern before the type-I infection might be obtained by examining late convalescent sera from the patients. Sera taken from four to six months after the onset of illness were therefore tested at the same time as one of the earlier specimens. In 5 cases the type-II antibody was no longer detectable in these late convalescent sera, and in 1 other case (case 25) it had fallen from 1 in 32 to 1 in 4. The other patient (case 26) had a type-II antibody titre of more than 1 in 64 in both early and late specimens. In only this latter case do we consider that there was definite serological evidence of a previous infection with type-II virus.

The amount of serum available in some cases limited the number of titrations which could be done, but, where possible, type-III antibody was also titrated. In 5 of the 6 patients who had type-III antibody the titres were 1 in 64 or greater. In the remaining 1 (case 26) the titre, which was 1 in 32 in early convalescence, had fallen to less than 1 in 4 six months later. The presumed antibody pattern of the patients before they experienced their paralytic infections is shown in table I.

The number of persons of the same age as the type-I paralytic patients who might have been expected to have had type-II antibody can be calculated approximately from the results of a survey of poliovirus antibody in children of different ages in Northern Ireland (see table II). If we assume that the antibody-rate remains constant after the age of 5 years at the level found in 5-year-old children then the chance of a person of any age having type-II antibody may be calculated from the table and expressed as a fraction of 1. The sum of the fractions calculated for persons of a similar age to the 26 patients with type-I paralytic poliomyelitis is 13. Thus 13 (50%) of the 26 patients might have been expected to have had a previous type-II infection. The evidence presented indicates that only 1 (4%) of the 26 patients had had such an infection. One explanation of this difference is that paralytic infections with type-I virus were less likely to occur in persons who had already experienced a type-II infection. This suggestion is supported by a study by Salk (1955) on

the antibody pattern in the sera of people who previously had paralytic poliomyelitis.

Additional evidence of an immunogenic relationship between types I and II of poliovirus (and between types II and III) is seen in Salk's (1955) investigations of the antigenicity of monovalent formolised vaccine in persons with different pre-vaccination serum-antibody patterns.

It is obvious that the protective cross-immunity which the results indicate may vary in different parts of the world and at different times because of variations in the antigenic structure of the prevalent virus strains. The time interval between infections with the different types of virus might also influence the degree of cross-protection. The importance of cross-protection against paralytic disease between the three types of poliovirus lies in its practical application to the problem of active immunisation with living attenuated viruses. An attenuated type-II-virus vaccine might not only protect against type-II paralytic disease but also give a good measure of protection against paralytic disease caused by the other two types. The large-scale use of an attenuated type-II-virus vaccine would presumably not effect the endemic status of type-I and type-III viruses. Therefore, after immunisation with type-II virus, natural infections with the other types would continue as they do now, and produce a long-lasting immunity, but with less risk of paralytic infections.

Summary

Among 26 cases of type-I paralytic poliomyelitis a lower rate of previous infection with type-II virus was found than in the general population.

A degree of cross-protection against paralytic disease between type-I and type-II viruses is thought to explain this difference.

The possible value of an attenuated type-II-virus vaccine is discussed briefly in the light of these findings.

We wish to thank Prof. G. W. A. Dick and Dr. E. Cheeseman for their help and advice; Dr. F. Kane and Dr. A. Crawford, of the Northern Ireland Fever Hospital, for the clinical history of the patients and the specimens; and Mr. R. Nelson for valuable technical assistance.

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TESTICULAR DYSGENESIS

AFFECTING THE SEMINIFEROUS TUBULES PRINCIPALLY, WITH CHROMATIN-POSITIVE NUCLEI

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THE more appropriate sex from clinical and social points of view, the somatic sex, is often contrary to the chromosomal sex inferred from cytological tests in gonadal dysgenesis ("ovarian" agenesis), in which the somatic sex is female but the chromosomal sex most frequently male (Grumbach et al. 1955, Barr 1956a). Also, in a proportion of male pseudohermaphrodites the somatic sex is female but the chromosomal sex male. A similar discrepancy between nuclear and somatic morphology is found in the condition described below; but this time the somatic sex is male and the chromosomal sex female.

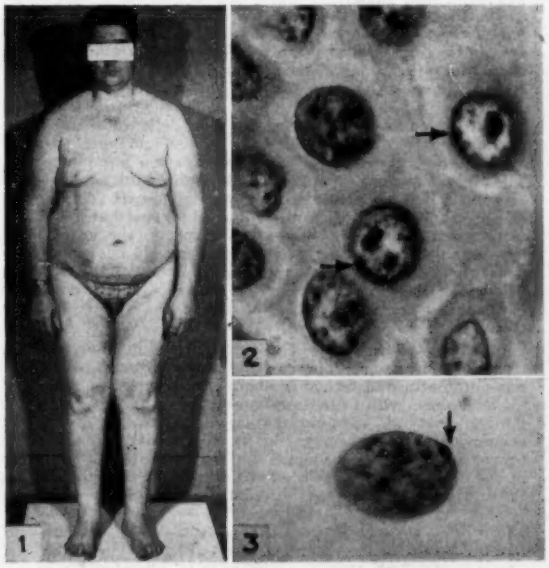

Fig. 1—Case 1, aged 34.

Fig. 2—Nuclei of epidermis (case 1) showing sex-chromatin. (Formol-acetic-alcohol fixation, hæmatoxylin and eosin. × 1800.)

Fig. 3—Nucleus of epithelial cell in smear of oral mucosa (case 1) showing sex-chromatin. (Alcohol-ether [50 : 50] fixation, cresylecht violet. × 1800.)

It has been proposed that, in clinical work, the term chromatin-positive be used for female-type nuclei that contain the sex-chromatin, and chromatin-negative for male-type nuclei that lack sex-chromatin (Barr 1956b). This practice may avoid placing an unnecessary psychological burden on the patient.

Although some true hermaphrodites with both testicular and ovarian tissue have chromatin-positive nuclei, until the inception of the present work patients with chromatin-positive nuclei and testicular tissue only had not been observed. Our attention was directed to this new application of cytological tests of sex by a biopsy specimen of skin with chromatin-positive nuclei, with an accompanying diagnosis of Klinefelter's syndrome, that was submitted for interpretation by Dr. Nicola D'Onghia, of Milan. This development is of importance since the ætiology of the type of primary testicular abnormality under discussion is obscure. The presence of chromatin-positive nuclei in patients with Klinefelter's syndrome, where the dominant feature is dysgenesis of the seminiferous tubules, has been noted independently (Nelson 1955, Bradbury et al. 1956).

Case-reports

Case 1.—A single man, aged 34, sought medical advice because of undescended testes. Birth and early development were said to have been normal. Neither testis had ever been normally situated in the scrotum, but the left one was palpable at times high in the scrotum. The patient's beard began to grow in adolescence, but he has never had to shave more often than once a week. There was no history of mumps or injury to the genital area. The patient had 4 normal siblings. He was not a twin.

On examination he was obese (fig. 1), his weight having increased from 170 to 220 lb. in the past three years. His height was 67 inches, span 69 inches, and length from pubis to crown 32 inches, and from pubis to floor 35 inches. His voice was well modulated, but he could not recall any definite change in his voice during adolescence. He had moderate gynæcomastia and considerable deposition of fat over his hips,

abdomen, and shoulders. The hair of his head was thick, without recession at the temples. His beard was very slight, but there was a moderate growth of hair in the axillæ and pubic area. His penis and scrotum were normally formed, but the penis was rather small. The patient was photographed (fig. 1) after the testes had been biopsied, drawn into the scrotum, and anchored to its fascia, accounting for the retraction of the scrotum seen in the illustration. The left testis measured about 1·0 × 1·0 × 1·5 cm.; it was tender and soft, situated high in the scrotum, and migrated into the inguinal canal. The right testis was palpable in the canal and felt soft and atrophic. A small prostate gland was felt on rectal examination. An ejaculate of 1·0 ml. contained no spermatozoa. The urinary excretion of 17-ketosteroids was on the low side of the normal range (8·2, 9·1, and 6·6 mg. per 24 hours on three occasions). The urinary excretion of gonadotropin, estimated by the method of Easterling et al. (1951), was definitely increased, being >25 and >35 rat uterine units on two occasions.

Cytological tests of sex.—The nuclei in a skin biopsy and in a smear from the oral mucosa were clearly chromatin-positive. Sex-chromatin was present in about three-fourths of epidermal nuclei stained with hæmatoxylin and eosin (fig. 2) and by the Feulgen method. Sex-chromatin was present in about half the nuclei in the oral smear (fig. 3). (As must be done in these preparations, only those nuclei that were suitable for the study of the details of their internal structure were considered.) In both preparations the sex-chromatin was typically female in all morphological and staining characteristics, and it was impossible to distinguish the sections of skin and the smear of oral mucosa from those of normal females. Difficulty was experienced in the interpretation of blood-films because, contrary to expectation after studying the sections of skin and the oral smear, neutrophils with a female morphology were rare. Dr. William M. Davidson, of King's College Hospital, London, kindly studied the blood-film from this patient and reported that 784 neutrophils had to be examined to find 6 of the female type. This low incidence of neutrophils with typical "drumsticks" is outside the limits established by Davidson and Smith (1954) for normal females.

Testicular biopsies.—Biopsy specimens of both testes were obtained during operation (Dr. L. N. McAninch) to fix the testes in the scrotum. The testes appeared on exposure to be about a third of the normal size. An epididymis and vas deferens were present on each side. The interior of the pelvis was explored, and no female organs were found. The histological structure of the biopsy specimens from the right and left testes was the same. Most of the tissue consisted of completely hyalinised and shrunken seminiferous tubules and clumps of Leydig cells (fig. 4), which appeared reasonably normal and occasionally occurred in larger aggregates than those illustrated in fig. 4. There were a few seminiferous tubules, with thickened and fibrotic walls, that contained Sertoli cells or undifferentiated cells (fig. 5). The nuclei were chromatin-positive both in the Leydig cells (fig. 6) and in cells within the tubules (fig. 7). This point was verified by the study of Feulgen preparations.

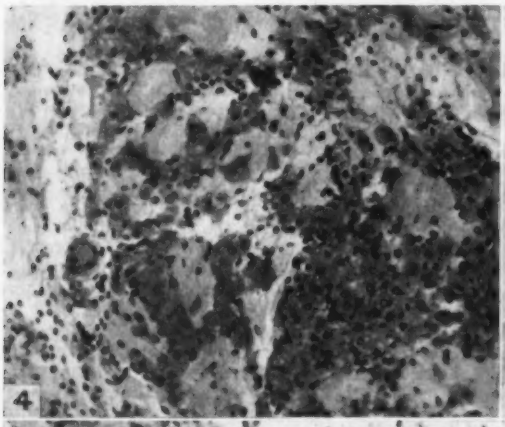

Fig. 4—Hyalinised seminiferous tubules and clumps of Leydig cells in biopsy specimen of testis in case 1. (Formol-acetic-alcohol fixation, hæmatoxylin and eosin. × 150.)

Fig. 5—Seminiferous tubules (case 1) with fibrotic walls, containing Sertoli cells and undifferentiated cells. (Formol-acetic-alcohol fixation, hæmatoxylin and eosin. × 150.)

Fig. 6—A few Leydig cells from fig. 4, showing chromatin-positive nuclei (× 1800).

Fig. 7—Nucleus of a Sertoli cell in one of the tubules illustrated in fig. 5, showing sex-chromatin (× 1800).

Case 2.—A man, aged 52, had been married since the age of 27 but had no children. His family history and previous history contained no relevant data. He began shaving in adolescence and continued to do so once a week. His voice changed somewhat in adolescence. Nocturnal emissions occurred at intervals up to the present time.

On examination the patient was tall and obese, with considerable fat padding over the abdomen and prominence of both breasts (fig. 8). The hair of his head was thick, without recession at the temples. Beard growth was minimal, and there was little axillary and body hair. The pubic hair was rather sparse and of feminine distribution. The skin was smooth and clear. Although the breasts were prominent, palpation revealed no definite glandular tissue or lobulation, and the nipples were not hypertrophied. The penis was moderately well developed. The testes were small (about 1·0 × 1·0 × 1·5 cm.), soft, and located in the scrotum. An ejaculate of 2 ml. contained no spermatozoa. The urinary output of 17-ketosteroids was low (3·7, 5·1, and 3·5 mg. per 24 hours on three occasions). The urinary excretion of gonadotropin was 5–10 rat uterine units (within the normal range) on two occasions. We are indebted to Dr. F. S. Brien, professor of medicine, for permission to publish these data.

Psychology.—The patient was interviewed by a psychiatrist, Dr. R. H. Prince, who summarised his report as follows: "This is a man of limited intelligence who is reacting to his incompetence in the sexual area with a good deal of wish-fulfilling ruminations over fantasied heterosexual prowess. It is probable that his hostility toward women is a reaction to hetero-

Fig. 8—Case 2, aged 52.

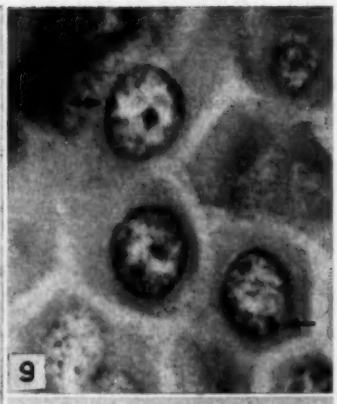

Fig. 9—Nuclei of epidermis (case 2) showing sex-chromatin. (Formol-acetic-alcohol fixation, hæmatoxylin and eosin. × 1800.)

Fig. 10—Nucleus of epithelial cell in smear of oral mucosa (case 2) showing sex-chromatin. (Alcohol-ether [50 : 50] fixation, cresylecht violet. × 1800.)

sexual inferiority rather than on the basis of a latent homosexual orientation."

Cytological tests of sex.—Typical female sex-chromatin was present in about three-fourths of epidermal nuclei (fig. 9) and in about half the suitable cells in a smear from the oral mucosa (fig. 10). These preparations were therefore typically chromatin-positive, and could not be distinguished from those of a normal female. Our interpretation of the blood-film was equivocal, as in case 1. Dr. Davidson reported finding 6 neutrophils with a female morphology in 900 cells. This low incidence of neutrophils with "drumsticks" is again outside the range for normal females.

Testicular biopsy.—A biopsy specimen of the left testis was obtained by Dr. L. N. McAninch. It consisted mainly of poorly organised connective tissue containing clumps of Leydig cells (fig. 11). There was considerable cytoplasmic vacuolation of the Leydig cells, which were otherwise normal except for the presence of sex-chromatin (fig. 12). Remnants of seminiferous tubules were not located.

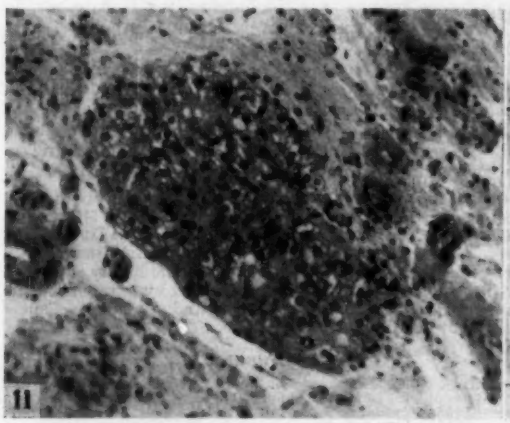

Fig. 11—Clumps of Leydig cells in biopsy specimen of testis in case 2. (Formol-acetic-alcohol fixation, hæmatoxylin and eosin. × 150.)

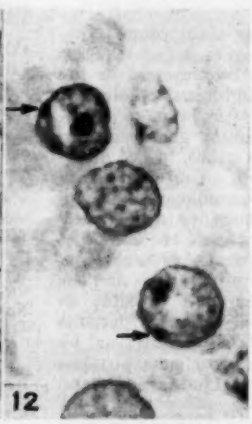

Fig. 12—Leydig cells from fig. 11 showing sex-chromatin (× 1800).

Measurements of Sex-chromatin

Although the sex-chromatin in cases 1 and 2 appeared to be as large as in normal females, measurements seemed advisable in view of the unusual findings. Accordingly Dr. K. L. Moore measured 30 sex-chromatin masses with a filar micrometer eye-piece in epidermis, oral smears, and Leydig cells from each of the patients. The mean values are shown in the accompanying table together with the size of the sex-chromatin in normal females recorded in published reports. Such differences as are shown in the table are not considered to be of any significance, in view of the difficulty in measuring such a small object accurately, and since values of 0·8 × 1·4 μ and 0·9 × 1·3 μ are on record for the mean size of the sex-chromatin in cartilage and adrenal cortex respectively in normal females (Moore and Barr 1955a).

Discussion

The evidence now available indicates that the sex-chromatin of female cells represents heteropyknotic portions of the two X chromosomes that adhere to each other. The evidence in favour of this view has been presented elsewhere (Barr 1955). It is therefore inferred that cases 1 and 2 bear two X chromosomes, although in this and certain other types of error of sex development there might conceivably be an XXY or other unusual sex-chromosome complex that includes two X chromosomes, rather than the normal XX complex of female cells. Lennox (1956) has reviewed in detail the progress made in the study of sex-chromatin and its application to clinical problems.

SIZE OF SEX CHROMATIN (μ) IN CASES 1 AND 2 COMPARED WITH THAT OF NORMAL FEMALES

Location of cells	Case 1	Case 2	Normal females
Epidermis	0·8 × 1·2	0·9 × 1·2	0·7 × 1·2 (Moore and Barr 1955a)
Oral mucosa ..	0·7 × 1·3	0·8 × 1·3	0·7 × 1·2 (Moore and Barr 1955b)
Leydig cells	0·8 × 1·2	0·8 × 1·1	..
Mean of 20 tissues ..	..	..	0·7 × 1·2 (Moore and Barr 1955a)

Case 1 satisfies the requirements for its inclusion in the syndrome described by Klinefelter et al. (1942) modified by Heller and Nelson (1945): hyalinisation of the seminiferous tubules but essentially normal Leydig cells; azoöspermia; and increased urinary excretion of gonadotropins. Hitherto patients included in this syndrome have not been cryptorchid.

Case 2, with no seminiferous tubules in the biopsy specimen and with normal excretion of gonadotropins, is difficult to classify according to current nomenclature. Possibly the findings in this patient might have been those of Klinefelter's syndrome had he been studied at an earlier age.

The ætiology of Klinefelter's syndrome and related primary testicular disorders has been puzzling ever since these cases were first recognised. Most workers felt that the abnormality was congenital or "constitutional." The present investigation amply confirms that this is so in some cases at least. Further suggestions must be

highly speculative, but the following possibilities may be considered in the light of the new findings. The possible ætiological factors may be either extrinsic, acting on the early embryo, or intrinsic, of genetic origin.

Extrinsic Factors

An androgenic hormone acting on a female embryo at the critical period of gonadal differentiation might conceivably cause the indifferent gonads to develop into defective testes rather than ovaries. A hormonal mechanism of this nature would have to operate early in the life of the embryo, probably during the latter part of the second month of gestation. However, so far as is now known, female human embryos respond to androgens by partial masculinisation of the external genitalia, as in the adrenogenital syndrome, and the internal genitalia are not affected. Further, in experiments on animals the gonads of female embryos have proved resistant to masculinisation, compared with other components of the reproductive tract, when androgens are administered to the mother during gestation (Greene 1944). A freemartin condition, similar to that which occurs in cattle, is ruled out since neither of the patients here described was a twin.

Grumbach et al. (1955) postulate that a deleterious agent, of unknown nature but presumably non-hormonal and maternal in origin, may produce gonadal dysgenesis (" ovarian " agenesis) by adversely affecting the embryo. The varied congenital defects that may result from rubella infection during the first trimester of pregnancy are cited in support of this suggestion. Ætiological factors of this general nature may operate in producing the abnormality exemplified by cases 1 and 2, but it is difficult to imagine the development of testes in this way, even though they are abnormal.

Intrinsic Factors

It seems more likely that the abnormality is the result of a fault in the sex-determining genes in a zygote that bears two X chromosomes. There are several ways in which such a genetic fault could be produced in theory, and the information necessary to choose between them is not available. The error may lie in the presence of an unusual sex-chromosome complex, such as XXY ; but the genetic effect of a chromosome complex of this nature is not known for mammals. Greene et al. (1954) have offered evidence for an XXY complex in a true hermaphrodite with chromatin-positive nuclei. Perhaps some true hermaphrodites and cases 1 and 2 have a common or similar ætiology, and perhaps the clinical manifestations of the two conditions will be found to be connected by intermediate cases.

If these patients bear the XX sex-chromosome complex, which is more likely, there may be a genetic fault arising from a mutation in either the maternal or the paternal germ-cell line. Or, as an additional possibility, there may have been a crossing over between an X chromosome, bearing female-determining genes, and an autosome, bearing male-determining genes, in the germ-cell line of one of the parents. Such an interchange of chromosomal material between non-homologous chromosomes could lead to male genetic dominance in the subsequent zygote, even though it bears two X chromosomes or at least two chromosomes that behave as X chromosomes in so far as the property of heteropyknosis and the formation of sex-chromatin is concerned. Possibly an unusual genotype in the somatic cells of these patients may be partially responsible, either directly or by altering tissue response to hormones, for such physical findings as gynæcomastia, retardation of hair growth, and the location of major deposits of fat.

The experiments of Jost (1953) on gonadectomised rabbit embryos indicate that the embryonic testis plays a decisive rôle in the maturation of the male reproductive tract. The observation that most patients with gonadal dysgenesis (" ovarian " agenesis) are chromatin-negative suggests that a hormone or inductor elaborated by the fœtal testis serves the same purpose in man (Grumbach et al. 1955, Barr 1956a). Since a male duct system was normally developed in cases 1 and 2, it is assumed that the interstitial cells of the testes maintained a normal level of activity during fœtal life. This emphasises that the principal gonadal defect was in the seminiferous tubules.

The failure of the neutrophils to conform to a typical female pattern defies explanation. Serological studies have shown that twin cattle embryos exchange precursors of hæmopoietic cells through vascular anastomoses between the fused placentæ (Humble 1954). A mixture of leucocytes of male and female origin would offer a possible explanation for the equivocal morphology of the neutrophils in these patients. However, credence cannot be given to the possibility of an extreme freemartin condition, since neither of the patients was a twin, and the possibility that a male twin had been resorbed in utero is too remote to be considered seriously. This troublesome finding may prove to be a blessing in disguise because the search for a cause for the discrepancy may lead to interesting developments.

It is obvious from the foregoing discussion that the observations on these patients raise, rather than answer, questions. Cytological studies on similar cases are clearly necessary to find out the relationship between nuclear structure and clinical findings in primary male hypogonadism. Cytological tests of chromosomal sex should also be made in certain types of dystrophia myotonica (Nadler et al. 1950) and other syndromes where hypogonadism may be a component of the disorder. It would be of special interest to know the chromosomal sex where the testicular deficiency is familial, as in cases described by Reifenstein (1947) and Sohval and Soffer (1953). Fortunately the investigation need not be restricted to new cases, since Leydig cells are reasonably satisfactory for the study of sex characteristics of nuclei. Testicular biopsies on file may therefore be used if they are of the high technical quality required for the study of fine nuclear detail. In addition to cases 1 and 2 specimens with chromatin-positive nuclei from 14 patients with Klinefelter's syndrome or closely related abnormalities have been studied in the department of microscopic anatomy, which suggests that this particular congenital error of sex development is not really rare.

Summary

Two cases are described in which dysgenesis of the seminiferous tubules was the outstanding feature.

In both cases the nuclei were chromatin-positive in a skin biopsy, in a smear from the oral mucosa, and in the Leydig cells of the testes.

The study of blood-films for the detection of chromosomal sex gave equivocal results.

These cases are considered to represent a congenital error of sex development, probably genetic, arising in embryos whose cells contained two X chromosomes.

An account of this study was presented at the annual meeting of the American Association of Anatomists, Milwaukee, Wisconsin, April 4–6, 1956 (Plunkett and Barr 1956a). A preliminary note has also appeared (Plunkett and Barr 1956b). We are indebted to Dr. W. M. Davidson who kindly examined the blood-films. This work was supported by grants from the National Research Council of Canada and the Ontario Cancer Treatment and Research Foundation.

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PRIMARY MALE HYPOGONADISM WITH FEMALE NUCLEAR SEX

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FROM different parts of the world have come four reports of female nuclear chromatin pattern in anatomically male hypogonadal persons (Bradbury et al. 1956, Plunkett and Barr 1956, Riis et al. 1956, Jackson et al. 1956). Our patient is described in more detail here.

Case-report

Case 1.—A man, aged 35 (fig. 1). No relevant previous illness. In childhood he appeared a normal boy, but puberty did not occur. His penis and testes remained small, his voice did not break, and shaving was not necessary. He developed no interest in women: erections and emissions were occasionally experienced. After irregular treatment with testosterone his penis became larger, his facial hair grew, some temporal recession occurred, and his voice underwent a slight change. After the age of 22, he became fat, and there was some growth in the mammary region. He developed homosexual tendencies.

Examination.—He was obese, stocky, and of feminine build, with deposits of fat on his breasts, buttocks, hips, and pelvic girdle. He had coxa vara and genu valgum. Height 64 in., span 65½ in., weight 180 lb. The penis was at the small end of normal range; the testes were fully descended but soft and tiny; and the epididymes were present. His facial skin was pale and soft, with sparse growth of hair on lips and chin; his axillary hair was adequate, and his pelvic escutcheon was of female type. His thyroid cartilage was small and his voice high. No abnormalities were found in his other systems.

Special Investigations

Urinary excretion of *17-ketosteroids* 5·6 and 7·3 mg. per 24 hr. *Basal metabolic rate* normal. Urinary excretion of *follicle-stimulating hormone* strongly positive at 48 mouse uterine units in 24 hours. *Eosinophil-count* 220 per c.mm. *Serum-cholesterol* level 317 and 254 mg. per 100 ml. *Serum-sodium* level 145 mg. per 100 ml.

X-ray examination showed a normal pituitary fossa. The epiphyses of the pelvis and hands were fused, and there was no gross osteoporosis. The pelvis was moderately gynecoid.

Water test (Soffer test).—Subnormal diuresis on first occasion but normal on repetition.

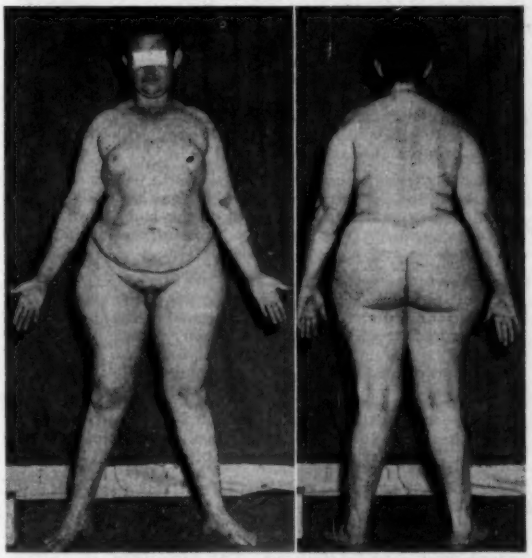

Fig. 1 (case 1)—Obese eunuchoid with fatty "breasts" who had received some testosterone therapy.

Histology of Testes (figs. 2 and 3)

Biopsy specimens of testes were fixed in formol-saline solution and embedded in paraffin wax. Sections were stained with hæmatoxylin and eosin, phosphotungstic acid and hæmatoxylin, periodic acid Schiff technique, Verhoef's elastic, and van Gieson's collagen stain.

The histological features of the two testes are essentially similar. The tunica albuginea is thickened and contains abundant collagen. Seminiferous tubules are scanty, and the lumina of most of them are lined by Sertoli cells only; germinal cells are completely absent. In some of the tubules the basement membranes and the tunica propria are thickened and hyaline; in the majority they appear essentially normal. The thickening is produced by several layers of laminated collagen (involving predominantly the tunica propria) with spindle-shaped fibroblastic nuclei interspersed between them. Elastic tissue is absent. Occasional tubules are completely sclerosed and present as almost solid cords of collagen from which all lining cells have disappeared.

The Sertoli cells have a foamy cytoplasm and in some instances they can be seen lying free in the lumina of the tubules. No crystalloids are present in these cells.

The interstitial cells show a variety of appearances. The most striking are the polyhedral Leydig cells which occur in groups and sheets in between and around the tubules. These cells have well-defined cytoplasmic borders, abundant cytoplasm (which is either clear and foamy or eosinophil), and prominent vesicular nuclei. No inclusions, crystalloids, or refractile granules are present, but occasional cells contain wear-and-tear pigment. The collagen and the fibrocytes of the interstitium are not increased. The third cell type is intermediate in appearance between the first two, and is present in moderate numbers. Their nuclei are more fusiform

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ADDENDUM

Several notes on this subject have appeared since this paper was written:

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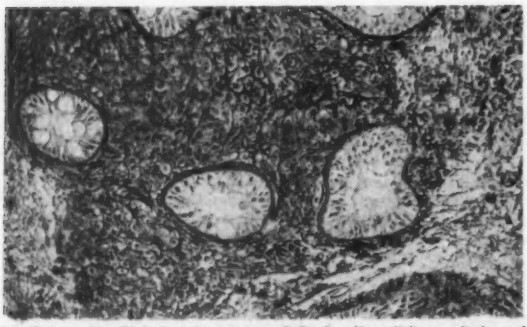

Fig. 2 (case 1)—Showing the extent of the Leydig-cell hyperplasia and the paucity of seminiferous tubules, which are lined by Sertoli cells only. The tunica propria of these tubules is not unduly thickened. (Phosphotungstic acid and hæmatoxylin. × 62.)

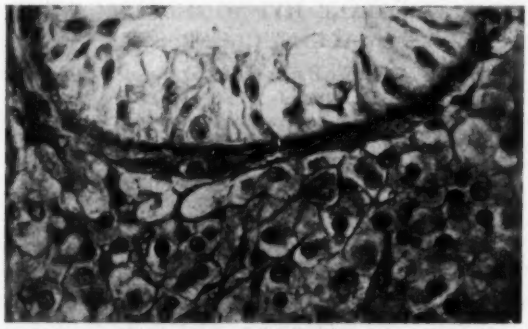

Fig. 3—Morphological appearances of Leydig cells and laminated thickening of tubular tunica propria. (Phosphotungstic acid and hæmatoxylin. × 375.)

and plump than those of the fibrocytes, and the cytoplasm is definitely eosinophil. They occur in groups like the Leydig cells or between the latter as isolated cells.

Nuclear Pattern

The nuclear pattern of the skin is female. 60% of the nuclei, in sections from both sides of the body, contain the "sex-chromatin." The nuclear pattern of the leucocytes is also female.

Laparotomy

At this stage we wondered whether the patient was a true hermaphrodite, perhaps with a third gonad containing ovarian tissue tucked away inside the abdomen. Prof. J. H. Louw performed a searching laparotomy but found no such organ. There was no trace of internal or external female genitalia.

Breast Biopsy

A biopsy specimen of breast, obtained at the same time as the laparotomy, confirmed our clinical impression that the "breasts" were fatty accumulations only.

Discussion

Type of Hypogonadism

Clinically this case was a typical example of male prepubertal gonadal failure. The high level of follicle-stimulating hormone indicated that the pituitary gland was not to blame; consequently the hypogonadism was primary.

Klinefelter, Reifenstein, and Albright (1942) originally described the syndrome of primary pubertal hypogonadism with normal male puberty, true gynæcomastia, and sterility, associated with hyalinisation of the seminiferous tubules. Nelson and Heller have widened the concept of Klinefelter's syndrome to include prepubertal Leydig-cell failure (with eunuchoidism) with absent or fatty gynæcomastia (Heller and Nelson 1945, Nelson and Heller 1945).

Testicular Histology

Microscopically the testes show three salient features: (1) an abundance of Leydig cells; (2) germinal-cell aplasia with persistence of the Sertoli cells; and (3) minimal thickening and hyalinisation of the tunica propria and basement membrane.

The Leydig cells appear to be mature, except that the crystalloids and inclusions, usually associated with functional activity, are lacking. The cellular abundance is best explained by hyperplasia: if it were due to atrophy and disappearance of the tubules, with condensation and shrinkage of the interstitium, an increase of interstitial collagen as well could reasonably be expected. This, however, is not in excess of normal.

Both the Leydig-cell hyperplasia and the germinal-cell aplasia are features of the syndrome described by Klinefelter et al. (1942). But, in addition, their cases showed striking hyalinisation of tubular basement membrane and tunica propria, which in our patient is present only to a minor degree. This point of difference complies with the expanded concept of Klinefelter's syndrome described by Heller and Nelson (1945) and Nelson and Heller (1945), who emphasised that in the eunuchoidal group the sclerosis was not so marked, and, though Leydig cells varied in number, the tubules in some cases were lined by Sertoli cells and even by occasional germinal cells. The variability of tubular sclerosis in this syndrome is also mentioned by Sniffen et al. (1951), who found sclerosis inversely proportional to the number of Sertoli cells lining the tubules.

Thus our patient may be considered, both on clinical and histological grounds, to have the eunuchoidal form of Klinefelter's syndrome.

Meaning of Female Nuclear Pattern

There is no need to detail the discovery by Barr et al. (1950) of the nuclear (probably sex-chromatin) differences between male and female cells nor its application to medical science (*Lancet* 1955, Lennox 1956). Up to now, as Lennox (1956) said, the findings have been in keeping with current theories of sexual differentiation. From the work of Jost (1953), from evidence afforded us by gonadal dysgenesis with male nuclear sex, and on other grounds (Grumbach et al. 1955), we believe that the neutral human form is the female—i.e., a potential or "chromosomal" male needs male sex hormone and intact gonads for normal anatomical male intra-uterine differentiation; in its absence the sexual apparatus develops on female lines. On the other hand, if a chromosomal female embryo is deprived of gonads, differentiation is still along normal female lines. Male differentiation in a chromosomal female is possible only if an abnormal amount of male sex hormone is present at an early stage—e.g., in the congenital adrenogenital syndrome. Now, in Klinefelter and similar hypogonadal states there is no evidence of an increased intra-uterine formation of androgen, and, in any case, this would not account for the appearance of testes in a chromosomal female.

The finding of female nuclear chromatin in these conditions seems therefore to be at variance with either the validity of the nuclear "sexing" method or this theory of sexual differentiation.

There seems to be one way of reconciling this paradox. The study of hermaphrodites indicates that there must be a very early intra-uterine "sex hormone" or "sex evocator" which precedes the gonadal hormone and determines whether the primitive gonadal tissue becomes ovarian or testicular (Hoffenberg and Jackson 1956). In "chromosomal females" of the Klinefelter type a very early error must occur, through which the male sex evocator is produced and testes appear which are sufficiently active to compel male internal and external sex organs to develop. Such "testes," however, are

abnormal; the seminiferous tubules do not mature, and many such persons become eunuchoid.

Klinefelter's Syndrome with Male Nuclear Sex

We have since investigated two other patients with male hypogonadism of Klinefelter type. In both of them the nuclear sex was unquestionably male.

Case 2.—A European, aged 25, with entirely normal male pubertal development and no gynæcomastia, complained of having very tiny testes, which he thought followed mumps orchitis at the age of 17. Histological examination of bilateral testicular biopsy specimens, however, showed the classical type of Klinefelter's syndrome, with gross hyalinisation of the tubules and clumping, with apparent hyperplasia, of the Leydig cells without increase of the interstitial tissue. Leucocytes and skin cells, in excellent preparations, showed the male nuclear pattern (in the skin an average of 3 chromatin bodies were counted per 100 nuclei).

Case 3.—A European, aged, 17, complained of delay in puberty. He did not shave, his voice had not changed, and no axillary hair had appeared. His penis was of adult size, and his bone age not delayed. He was 5 ft. $10^1/_2$ in. tall, with a span of 5 ft. $11^1/_2$ in. He had no gynæcomastia. Again the testicular histology was that of the Klinefelter testis and the skin and leucocyte nuclear pattern was unequivocally male (not one "drumstick" in 1400 leucocytes).

It is therefore plain that not all cases of primary "male" pubertal hypogonadism of the Klinefelter group show the female nuclear sex pattern. In case 2 it might be argued that mumps orchitis could have produced the gonadal changes, unlikely though this may be. In case 3 there is no such possibility. It is noteworthy that both these patients with male nuclear sex showed no gynæcomastia, despite the typical histological picture of the testes (Klinefelter et al. 1942).

Summary

A case of male primary hypogonadism with eunuchoidism is presented. On clinical and histological grounds he belonged to the Nelson and Heller variety of Klinefelter's syndrome. His nuclear sex pattern was female. There was no trace of hermaphroditism, even on laparotomy.

A discussion of this case and its implications follows, together with a briefly outlined possible explanation for the apparent paradox of female nuclear sex in an anatomical male.

Two other cases of Klinefelter's syndrome are reported in which the nuclear sex pattern was male. Thus not all cases of Klinefelter's syndrome are "chromosomal females."

We wish to thank Prof. J. F. Brock, Prof. F. Forman, Prof. J. H. Louw, and Prof. J. G. Thomson for their help and encouragement; Prof. D. Stammers for sexing the leucocytes; Prof. H. Zwarenstein and Mr. D. G. Duncan for estimating the follicle-stimulating hormone; and Mr. B. Todt for the photographs of case 1. Case 2 was seen by courtesy of Dr. P. J. M. Retief, and case 3 by courtesy of Dr. A. J. S. Burger.

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GASTRIC CANCER

RELATIONSHIPS BETWEEN ABO BLOOD-GROUPS, SITE, AND EPIDEMIOLOGY

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IN the United Kingdom gastric carcinoma seems to be associated with blood-group A (Aird et al. 1953), but in Sydney prepyloric ulcers and carcinomas are associated with blood-group A and non-prepyloric ulcers and carcinomas with blood-group O (Billington 1956). The findings of Aird et al. (1954) would agree with the Sydney findings if 74·3% of the English carcinomas were prepyloric; only 37·5% of the Sydney series were prepyloric. In analysing this discrepancy I found that carcinoma of the cardia in Sydney was also associated with blood-group A (unpublished).

My present object is to show that carcinoma of the stomach is associated with differing ABO blood-groups according to its site in relation to the three different types of gastric glands, and to point out that further epidemiological studies of gastric carcinoma should take this fact into account.

Material

I have analysed the public inpatient records for 1947–54 of the four general teaching hospitals affiliated with the University of Sydney (Sydney Hospital, Royal Prince Alfred Hospital, St. Vincent's Hospital, and Royal North Shore Hospital). All cases of adenocarcinoma of the stomach were included in which the macroscopic diagnosis was confirmed microscopically from material obtained either at necropsy or at operation and where the site of origin of the lesion was unequivocal. ABO blood-group data were also recorded whenever possible. Cases in immigrants were excluded. The lesions were classified according to their relation to the three main types of gastric glands in man (Maximow and Bloom 1952).

Lesions were classified as *prepyloric* when they were limited to an area within 4 cm. of the pylorus or within the pyloric antrum; *cardiac* when they involved the cardio-œsophageal junction or an area of stomach not extending 3 cm. beyond the cardio-œsophageal junction; and *of the body* of the stomach when they did not extend into either the prepyloric or the cardiac area.

No case of diffuse carcinoma was included.

As controls for ABO blood-grouping Walsh's (1947) findings of the ABO blood-group distribution of 30,000 consecutive donors from the same area (Sydney) to the N.S.W. Red Cross Blood Transfusion Service were used.

Results

The results of the ABO blood-grouping according to site in 483 patients with gastric carcinomas are shown in table I, and the data are statistically analysed in table II.

As suggested by Aird et al. (1954), it appears reasonable to compare the ABO blood-group distribution of patients with carcinoma of the stomach with that of blood-donors from the same area in an apparently homogeneous population. In the present series, when groups B and AB are taken together, there is no significant difference in the ABO blood-group distribution of all patients with gastric carcinoma compared with the blood-donors ($\chi^2 = 0{\cdot}52$, with 2 degrees of freedom; $P > 0{\cdot}7$). However, the gastric carcinoma population is not homogeneous if the ABO blood-group distributions are examined according to the site of origin of the lesions within the stomach. There is no significant difference in the ABO blood-group

* In receipt of a part-time research grant from the Royal Australasian College of Physicians.

TABLE I—ABO BLOOD-GROUP DISTRIBUTION IN N.S.W. BLOOD-DONORS AND IN PATIENTS WITH GASTRIC CARCINOMA ACCORDING TO SITE

Population	Total	Blood-group			
		A	B	O	AB
Blood-donors	30,000	11,514 (38·38%)	2912 (9·70%)	14,672 (48·91%)	902 (3·01%)
Prepyloric carcinoma	172 (35·6%)	96 (55·8%)	13 (7·6%)	53 (30·8%)	10 (5·8%)
Body carcinoma	225 (46·6%)	47 (20·9%)	16 (7·1%)	154 (68·4%)	8 (3·6%)
Cardiac carcinoma	86 (17·8%)	50 (58·1%)	6 (7·0)%	24 (27·9%)	6 (7·0%)
Total gastric carcinoma	483	193 (40·0%)	35 (7·2%)	231 (47·8%)	24 (5·0%)

distribution when prepyloric carcinoma is compared with cardiac carcinoma ($\chi^2 = 0{\cdot}23$, with 2 degrees of freedom; $P > 0{\cdot}8$), and these two groups are considered together. There is a highly significant difference in ABO blood-group distribution when body carcinoma is compared with prepyloric and cardiac carcinoma together ($\chi^2 = 77{\cdot}62$, with 2 degrees of freedom; $P < 0{\cdot}001$). Furthermore, there is a significant difference between the ABO blood-group distribution of patients with prepyloric and cardiac carcinoma compared with the blood-donors ($\chi^2 = 41{\cdot}64$, with 2 degrees of freedom; $P < 0{\cdot}001$), the incidence of blood-group A among patients with carcinoma being 21·1% above the expected value. There is a significant difference in a similar comparison made between patients with body carcinoma and the blood-donors ($\chi^2 = 36{\cdot}31$, with 2 degrees of freedom; $P < 0{\cdot}001$), the incidence of blood-group O among patients with carcinoma being 19·5% above the expected value.

Comparisons of the ABO blood-group distributions according to sex revealed no significant differences between the controls and the patients with gastric carcinoma taken according to site, nor was any significant sex difference in blood-groups demonstrable between sites.

Table III shows the ABO gene frequencies of blood-donors and patients with gastric carcinoma classified according to site, prepyloric and cardiac lesions being taken together (calculated by the method of Dobson and Ikin 1946). In this small series no significant difference exists in the incidence of blood-group gene B when gastric carcinoma is compared with the controls, and this is in accord with the figures of Aird et al. (1954) in England. Further, no significant difference in the incidence of blood-group gene B appears when the lesions are compared according to site. In patients with body carcinoma blood-group gene O occurs 20·4% more frequently than in the blood-donors, and in patients whose carcinoma involves either the prepyloric or the cardiac region of the stomach blood-group gene A occurs 64·3% more frequently than in the control population.

TABLE II—GASTRIC CARCINOMA: ANALYSIS OF COMPARISONS OF A : O : AB + B RATIOS

Comparison	χ^2 for heterogeneity D. of F. = 2	Probability
Blood-donors v. total gastric carcinoma	0·520	>0·7
Prepyloric carcinoma v. cardiac carcinoma	0·23	>0·8
Prepyloric carcinoma plus cardiac carcinoma v. body carcinoma	77·62	<0·001
Prepyloric carcinoma plus cardiac carcinoma v. blood-donors	41·64	<0·001
Body carcinoma v. blood-donors	36·31	<0·001

Comparisons of intragastric localisation of carcinoma will depend on the criteria of selection of cases. Table IV shows the site incidence according to the method of obtaining material. No significant difference is shown according to whether the specimens were obtained at necropsy or at operation (the three intragastric subdivisions being taken into account, $\chi^2 = 4{\cdot}48$, with 2 degrees of freedom; $P > 0{\cdot}1$).

Discussion

The results will be considered from two points of view—validity and interpretation.

Validity

It is necessary to show that disease attack-rates differ between blood-groups before accepting that associations exist between blood-groups and disease (Woolf 1955). Although no absolute rates of incidence are available, comparisons of incidence-rates suffice. Table V shows the results of such comparisons on the present series as regards blood-groups A and O. Significant differences exist between these blood-groups in comparing the control population with patients with either body carcinoma or carcinoma involving the prepyloric and cardiac regions together. Moreover comparison of the ratios of body carcinoma to prepyloric and cardiac carcinoma between blood-groups A and O shows a highly significant difference ($\chi^2 = 70{\cdot}20$, with 1 degree of freedom; $P < 0{\cdot}001$). It is therefore concluded that, within blood-groups A and O, there are significant differences in incidences of body carcinoma compared with prepyloric and cardiac carcinoma.

TABLE III—ABO GENE FREQUENCY IN N.S.W. BLOOD-DONORS AND PATIENTS WITH GASTRIC CARCINOMA ACCORDING TO SITE

Population	Blood-group		
	A	B	O
Blood-donors	0·235	0·066	0·698
Carcinoma cardiac + prepyloric	0·386	0·064	0·550
Carcinoma of body	0·117	0·043	0·840

It is possible that the results may be brought about by bias in collecting the samples. It will therefore be necessary to show that the associations outlined above apply to data obtained elsewhere. The findings of Aird et al. (1954) in England seem to offer some support. If we examine only blood-groups A and O in the present series, it will be seen that the $\frac{A}{A+O}$ ratio for body carcinoma is 0·23, and for prepyloric and cardiac carcinoma together 0·65. If these ratios are applied to the $\frac{A}{A+O}$ ratio of 0·48 obtained by Aird et al. (1954) in their 2745 cases of carcinoma, it is evident that the English figures could be accounted for if 58·9% of their cases of carcinoma occurred in the prepyloric and cardiac regions. This figure does not differ significantly from the figure of 53·2% from the present series irrespective of blood-group determinations (table IV).

Could results be explained by incomplete or unequal miscegenation? Carcinoma of the stomach is well known

TABLE IV—SITE OF ORIGIN OF GASTRIC CARCINOMA ACCORDING TO METHOD OF OBTAINING MATERIAL

Site	No. of cases (% of total)	Operation specimen (% of operation total)	Necropsy (% of necropsy total)
Prepyloric	198 (35·9%)	133 (38·4%)	65 (31·7%)
Body	258 (46·8%)	150 (43·4%)	108 (52·7%)
Cardia	95 (17·3%)	63 (18·2%)	32 (15·6%)
Total	551	346 (62·8%)	205 (37·2%)

TABLE V—COMPARISONS OF SITE-INCIDENCE RATIOS OF GASTRIC CARCINOMA WITHIN A AND O BLOOD-GROUPS

Comparison	χ^2 for heterogeneity* (D. of F. = 1)	Probability
Prepyloric + cardiac carcinoma v. blood-donors	39·06	<0·001
Body carcinoma v. blood-donors	32·05	<0·001
Body carcinoma v. prepyloric + cardiac carcinoma	70·20	<0·001

*Calculated by the method of Woolf (1955).

to have hereditary tendencies (Videbaek and Mosbech 1954), and a theoretical possibility is that, whenever the disease is manifest, other genetic patterns may show an apparent difference from the control non-carcinoma population. It would be necessary to postulate that the inheritance for gastric carcinoma was site-specific within the stomach and was carried by two separate genes to account for the A and O localisation influences. Further, there is evidence that the inheritance of gastric carcinoma is related to the inheritance of pernicious anæmia (Mosbech 1954)—a condition which, it is universally held, cannot coexist with chronic gastric ulcer, and in this latter disease the ABO blood-group localisation factors are similar to those demonstrated here for gastric cancer (Billington 1956).

It therefore appears reasonable to conclude that there exist associations between blood-group O and body carcinoma and between blood-group A and prepyloric and cardiac carcinoma. Within the present population of gastric-cancer patients those with blood-group O are 6·2 times more likely to develop carcinoma in the body of the stomach than those with blood-group A, who in turn are 6·2 times more likely to develop their carcinoma in the prepyloric or cardiac region than are those of blood-group O.

Interpretation

Associations between two characters in the general population can be accounted for on the basis that the same gene (or set of genes) affects both characters, or that one character is the physiological consequence of the other. Actual genetic linkage between characters can only be established by pedigree studies (Li 1954). Since the ABO blood-groups are genetically determined, it appears that significant genetic differences exist between patients with carcinoma of the body of the stomach and patients with carcinoma of the prepyloric and cardiac regions, and that both groups differ genetically from the control population. The site of carcinoma within the stomach seems to depend at least partly on genetic influences in addition to, and distinct from, those genetic influences which may predispose to the inheritance of gastric cancer per se. The initial suggestion of Aird et al. (1953) that blood-group A predisposes to the development of gastric carcinoma therefore does not seem to be valid, but it appears that the association between gastric carcinoma and the ABO blood-groups is related to site only, and that the blood-group gene B appears to be without localising significance.

TABLE VI—SITE-INCIDENCE OF GASTRIC CARCINOMA FROM DIFFERING SOURCES

Series	Place	Date	Method of obtaining material	Total	Prepyloric + cardiac	Body of stomach
Present	Sydney	1947–54	Necropsy and surgery	551	293 (53·2%)	258 (46·8%)
Harnett (1947)	London	1938–39	Necropsy and surgery	871	584 (67·0%)	287 (33·0%)

Since about 75% of the normal population can secrete the specific ABO blood-group mucoids into their gastric juice in the mucous component (Richmond et al. 1955), it has been postulated (Aird et al. 1954) that this fact may bear some relation to the genesis of gastric cancer. No information is available on the secretor status of patients with gastric cancer. It now appears that differences may exist between the mucous secretions of the different types of gastric glands. It had been concluded by Bensley (1938) that the cells of the pyloric and cardiac glands were essentially of the same type and displayed the same reactions as the neck chief cells of the fundic glands, but Jennings and Florey (1956) have shown in animals that the mucus produced by these cells differed in their uptake of ^{35}S in all the species tested. It appears from the present study that attention might be directed towards investigating not only the secretor status of patients with gastric carcinoma but also the immunological properties of the three types of gastric glands in relation to the ABO blood-groups.

TABLE VII—ABO BLOOD-GROUP DISTRIBUTIONS IN CONTROL POPULATIONS

Place	Series	Source	Number	Blood-group			
				A	B	O	AB
Sydney	Blood-donors	Walsh (1947)	30,000	11,514 (38·4%)	2912	14,672	902
London	Pregnant women	Discombe and Meyer (1952)	10,000	4219 (42·2%)	890	4578	313
Scotland	Hospital controls	Aird et al. (1953)	478	155 (32·5%)	56	252	15

Site in Relation to Epidemiology

If the associations between ABO blood-groups and the intragastric localisation of carcinoma are to be accepted, it might be anticipated that populations with differing over-all A and O blood-group gene frequencies might also show differences in the relative proportions of sites affected by gastric carcinoma. In this event intragastric localisation becomes a factor of some importance in the epidemiological study of gastric carcinoma as a whole.

Strictly comparable series from other localities are not readily available. A comparison can be made, however, between Sydney and London for both the ABO blood-group distributions in the general population and the site proportions of gastric carcinoma. When the present figures are compared with those of Harnett (1947) for the site-incidence of gastric carcinoma in London hospitals, there is a significant excess of prepyloric and cardiac carcinomas in London, 13·8% above the Sydney figure ($\chi^2 = 27·69$, with 1 degree of freedom; $P < 0·001$) (table VI).

When the findings of Discombe and Meyer (1952) for the ABO blood-group distribution of 10,000 pregnant women in N.W. London are compared with those of Walsh (1947) in Sydney blood-donors, there is a significant difference ($\chi^2 = 49·17$, with 3 degrees of freedom; $P < 0·001$), blood-group gene A occurring 2·6% more frequently in London than in Sydney. London therefore shows a significant increase in two characters of the population—the proportion of gastric cancers in the prepyloric and cardiac regions, and the proportion of healthy people carrying blood-group gene A. Further, if an $\frac{A}{A+O}$ ratio is calculated for the total Sydney series, from the observed $\frac{A}{A+O}$ ratio for each site but with the application of Harnett's London figure of 67·1% for the proportion of lesions found in the prepyloric and cardiac regions instead of the Sydney figure of 53·2%, there is

an over-all predominance in gastric carcinoma, irrespective of site, of persons of blood-group A in Sydney significant at the 1% level, compared with the Sydney blood-donors.

Thus the finding by Aird et al. (1954) of a significant association between blood-group A and gastric carcinoma in England may be explained by a higher proportion of prepyloric and cardiac lesions, along with a higher incidence of blood-group gene A in the general population in England. An analysis of the A : O : B+AB ratios for gastric carcinoma in the original data of Aird et al. (1953), when Scotland was included, reveals that there was no over-all predominance of blood-group A in the Scottish carcinoma series compared with the Scottish control population ($\chi^2 = 2{\cdot}28$, with 2 degrees of freedom ; $P > 0{\cdot}3$) ; and a significantly lower proportion of their controls in Scotland belonged to blood-group A compared with London ($\chi^2 = 19{\cdot}04$, with 2 degrees of freedom ; $P < 0{\cdot}001$) (table VII). It would be pertinent, in the light of the present communication, to inquire whether a significant difference also exists between London and Scotland regarding the site proportions of gastric carcinoma with a relative deficit of prepyloric and cardiac lesions in Scotland.

Obviously the occurrence of gastric carcinoma is the result of many factors, and the probable genetic influences demonstrated here will represent only a small facet of the multifactorial ætiology of the disease. Nevertheless it appears not inappropriate that an attempt be made to confirm the basic tenets of this communication—namely, that genetic influences play a part in the intragastric localisation of carcinoma, and that these influences are related to the ABO blood-group gene system. As a corollary, if these genetic influences are sustained, epidemiological studies of gastric carcinoma should take site into account, particularly in its relationship to the ABO blood-group gene system of the normal non-cancer population from which the material is derived. Analyses of similarities and differences between populations may reveal other ætiological factors in the genesis of gastric cancer which are not yet apparent.

Summary

In a Sydney population no over-all association was found between blood-group A and carcinoma of the stomach.

If gastric carcinoma is divided, in its relationship to the ABO blood-group system, according to the site of the three types of gastric glands, prepyloric and cardiac lesions are significantly associated with blood-group A, and body and fundus lesions are significantly associated with blood-group O.

There is a significant deficit in the proportion of carcinomatous lesions situated in the prepyloric and cardiac regions in Sydney compared with London, and there is a significant deficit in the incidence of blood-group gene A in the normal Sydney population compared with the normal London population.

Probably the association found in England between blood-group A and gastric carcinoma can be explained by the presence of a higher proportion of prepyloric and cardiac lesions, along with a higher incidence of blood-group gene A in England compared with Sydney.

Possibly the differential localisation of gastric carcinoma, and its relationship to the ABO blood-group gene system, may be of importance in the epidemiological study of gastric carcinoma as a whole.

I wish to acknowledge the permission of the superintendents of the four hospitals concerned to peruse their records, and to thank members of the N.S.W. Red Cross Blood Transfusion Service, Sydney, for assistance in the preparation of this paper.

ADDENDUM

Since this article was submitted further data have appeared. The incidence of prepyloric and cardiac carcinoma at the London Hospital (D. Jennings et al. *Lancet*, 1956, ii, 11) is 59·9% of the total, which does not greatly differ from the figure of 58·9% predicted above from the blood-group data of Aird et al. (1954). The contradictory results of D. R. Haddock and R. B. McConnell from Liverpool (*Lancet*, 1956, ii, 146) substantiate the argument that the epidemiological study of the disease should take blood-groups and site into consideration. A prospective study with strict uniformity in the selection of material for comparison appears desirable.

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HYPERCALCÆMIA DUE TO SARCOIDOSIS
TREATMENT WITH CORTISONE

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SARCOIDOSIS presents clinically in various ways. Hypercalcæmia is an occasional complication and a rare manner of presentation ; it is, however, an important one, and two such cases are reported here, together with the effects of cortisone therapy. As a contrast, the effects of cortisone and corticotrophin in two patients with other diseases and without hypercalcæmia are briefly given.

Methods

Standard laboratory methods were used ; metabolic balances were controlled as previously reported (Prunty et al. 1953). Alkaline phosphatase was determined by the King-Armstrong technique (King 1951).

Case-reports

Case 1.—A married woman, aged 57, was admitted in April, 1954, with a year's history of thirst, polyuria, and loss of weight of sudden onset. She had had a tonsillectomy in 1936 and repair of uterine prolapse in 1948. Her husband died of tuberculosis in 1941, and her daughter also had tuberculosis.

Initially she had lost $1^1/_2$ stone quickly, and her weight had since been stationary. She drank five or six pints of water a day besides her mealtime drinks ; she drank two pints each night and had to get up to pass water four times a night. She had noticed poor mental concentration and restlessness and occasionally vomited.

Examination

Her skin and lymph-glands appeared normal : her blood-pressure was 140/85 mm. Hg, and there were no abnormal signs in her chest. Her liver and spleen were impalpable. Her eyes showed no evidence of sarcoidosis, but both corneæ had peripheral epithelial opacity.

Her urine contained a trace of protein and a few leucocytes but was repeatedly sterile. The volume averaged 3600 ml. a day. In a water concentration and dilution test the specific gravity rose to 1·013 after twenty hours' dehydration and fell

to only 1·007 after drinking 1300 ml. of water. An intravenous pyelogram showed normal renal outlines, no calcification, excretion of dye without delay but in poor concentration, and normal calyces. Her blood-urea level was initially 89 mg. per 100 ml. A radiograph of her chest was normal, and radiographs of her skull, hands, and long bones showed no evidence of sarcoidosis or of hyperparathyroidism.

Examination of her blood showed plasma-calcium 12·3 mg. per 100 ml., plasma-phosphorus 4·4 mg. per 100 ml. (fig. 1), plasma-alkaline-phosphatase 6 units, plasma-sodium 141 m.eq. per litre, plasma-potassium 3·5 m.eq. per litre, plasma-chloride 103 m.eq. per litre, plasma-bicarbonate 26 m.eq. per litre, plasma-cholesterol 166 mg. per 100 ml. (esters 76%), plasma-creatinine 2·3 mg. per 100 ml. and twenty-four-hour clearance 27 ml. a minute, plasma-protein 6·7 g. per 100 ml. (albumin 3·4 and globulin 3·3 g. per 100 ml.) and, on electrophoresis, an increase of γ-globulin.

Investigations

Conservation of sodium.—To estimate the kidneys' ability to conserve sodium, the patient was first allowed a free intake of food; the urinary sodium was 113, 102, and 166 m.eq. on three successive days. Intake was then reduced for five days to a level calculated from McCance and Widdowson's (1946) diet tables to be 22 m.eq. a day; the urinary sodium on these five days was 115, 84, 57, 29, and 30 m.eq. a day; it was 21 and 15 m.eq. a day on the next two days when the sodium intake was raised to the original level. This was interpreted as a slow incomplete response to sodium restriction. After a break of three days urine collections were begun again; on the next two days the urinary sodium was 111 and 136 m.eq. a day. For the next two days 5 mg. of deoxycortone acetate was injected, and the urinary sodium was 93 and 126 m.eq. a day; two further days gave outputs of 126 and 142 m.eq. a day. This was interpreted as indicating defective tubular response to deoxycortone acetate.

Parathyroid activity.—To detect hyperparathyroidism the calcium-tolerance test of Howard et al. (1952) was used. During the calcium infusion the plasma-calcium level rose from 13·4 to 17·5 mg. per 100 ml. and the plasma-phosphorus level from 3·8 to 4·7 mg. per 100 ml.; the urinary excretion of phosphorus increased from 646 to 781 mg. a day (increase 21%). This result is about intermediate between those given by Howard et al. for hyper- and hypo-parathyroidism. A week later intravenous 'Para-thor-mone' 200 U.S.P. units was given; the urinary output of phosphorus was slightly increased during the next four hours (fig. 2), but phosphate clearance was not increased. These four results were taken to indicate that renal function was so defective that results of tests for parathyroid function could not be interpreted.

A *Mantoux test* was negative to 1/1000 and 1/100 Old Tuberculin.

Liver biopsy on June 2 showed a small number of non-caseating tubercles, sometimes with multinucleate giant cells, consistent with sarcoidosis or tuberculosis.

Cortisone Therapy

The patient was temporarily discharged and readmitted on July 20 for cortisone therapy, when her plasma-calcium was 11·8 mg. per 100 ml., plasma-phosphorus 4·5 mg. per 100 ml., blood-urea 68 mg. per 100 ml., renal clearances (ml. per min.) were inulin 26, *p*-aminohippurate 115, potassium 19, creatinine 36 (plasma-creatinine 2·3 mg. per 100 ml.); and urine volume on free fluid intake about 2980 ml. a day.

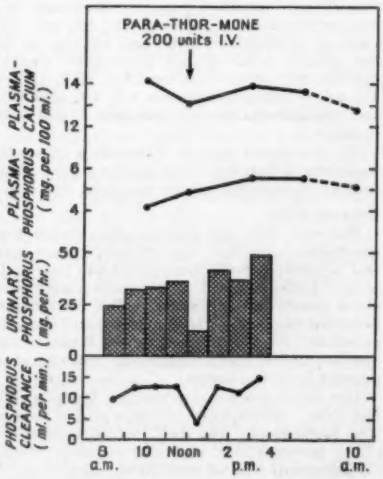

Fig. 2—Case 1: response to para-thor-mone 200 U.S.P. units injected at noon. Renal excretion and clearance of phosphorus were not significantly affected.

Cortisone acetate 200 mg. daily was given orally from July 23 for three days and then 100 mg. daily. The plasma-phosphorus level fell within three days and reached subnormal levels in eleven days; by then the plasma-calcium level had fallen to normal values. The urine volume decreased to 2220 ml. a day, and 1 kg. of weight was gained. The patient was discharged.

Progress (fig. 1)

After seven weeks on cortisone 100 mg. daily the renal clearances were inulin 29, *p*-aminohippurate 105 ml. a minute. The plasma-calcium and plasma-protein plasma-phosphorus levels were unchanged, and plasma-protein electrophoresis showed a return towards normal. The dosage of cortisone was gradually reduced because of the development of ankle œdema and the absence of renal symptoms. The plasma-calcium level remained below 11 mg. per 100 ml.

After seven months the dosage of cortisone was down to 37·5 mg. daily, but eight months later symptoms recurred, with nocturia, weight-loss of 7 lb., and plasma-calcium level 11·7 mg. per 100 ml. Increasing the cortisone to 50 mg. caused a subsidence of symptoms for four months. Then, with the reappearance of thirst and nocturia, the plasma-calcium level was found to be 13·8 mg. per 100 ml., and prednisone 15 mg. daily was substituted for the cortisone. Four and six weeks later her nocturia had again disappeared and plasma-calcium level was 10·3 and 10·6 mg. per 100 ml. Her blood-pressure has not changed.

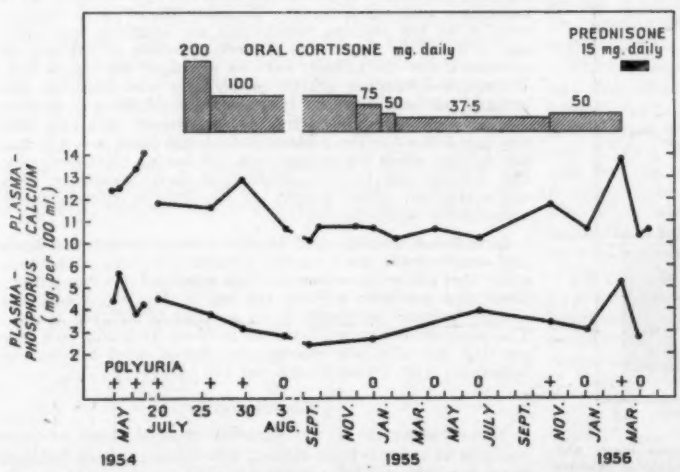

Fig. 1—Case 1: plasma-calcium and plasma-phosphorus levels and presence or absence of polyuria in relation to cortisone and prednisone therapy. (Note changes in time scale.)

Case 2.—A married woman, aged 68, came under our care when she was admitted in October, 1955, complaining of aching and weakness in both legs and generalised pruritus. In 1946 she had thirst, polyuria, and weakness of sudden onset. In 1947 she had a laparotomy for a suspected abdominal mass but nothing abnormal was found. An intravenous pyelogram at this time was normal. In 1948 she was investigated for urinary infection. An intravenous pyelogram then showed bilateral renal calculi. Her blood-urea was 52 mg. per 100 ml. and serum-calcium 11·6 mg. per 100 ml. She complained of left occipital pain and this led to biopsy of the left occipital artery. The sections showed thrombosis without inflammation. Biopsy of the pectoralis muscle at the same time showed "myositis, ? sarcoidosis." From 1951 onwards she had repeated attacks of pyelitis. In that year her urea-clearance

was 28% of standard normal, blood-urea 85 mg. per 100 ml., and serum-calcium 10·2 mg. per 100 ml. She passed a renal stone in September, 1954, and another in August, 1955. On the second occasion her blood-urea was 127 and 142 mg. per 100 ml., serum-calcium 14·1, 13·9, 13·9, and 13·5 mg. per 100 ml., plasma-phosphorus 4·3, 4·6, and 4·5 mg. per 100 ml., and plasma-alkaline phosphatase 6 and 7·7 King-Armstrong units.

On admission to St. Thomas's Hospital the pain and weakness in her legs made walking very difficult. She had no urinary symptoms except nocturia, six times nightly.

Examination

She was thin and had no skin lesion associated with her generalised pruritus. Her blood-pressure was 140/75 mm. Hg, and a harsh systolic murmur at the base radiated up into the neck. Both posterior tibial pulses were absent, but dorsalis pedis pulses were present. The liver extended two finger-breadths below the costal margin, and the spleen tip was easily palpable. No abnormalities were found in the central nervous system apart from weakness, but band calcification was present in both corneæ.

Her urine contained protein, a few pus cells, and occasional red cells. There were no casts and it was repeatedly sterile. The hæmoglobin was 69%, white cells were 5750 per c.mm. (72% polymorphs), and the erythrocyte-sedimentation rate (Westergren) was 40 mm. in the first hour. Wassermann and Kahn tests were negative.

When she was deprived of fluids for thirty-six hours, the specific gravity of her urine reached only 1·010, and after she drank a litre of water it fell to 1·006 in four hours. Her blood-urea level on admission was 146 mg. per 100 ml. Radiography of her chest was normal and of her abdomen showed a calcified fibroid. An intravenous pyelogram showed slow excretion and a probable slight hydronephrosis on the right side. There was no evidence of renal calcification. Radiographs of hands, skull, and long bones were normal.

The serum-protein level was 6·8 g. per 100 ml. (albumin 4·3 g. and globulin 2·5 g. per 100 ml.). On electrophoresis the pattern was normal. A Mantoux test was negative at 1/100.

Investigations (fig. 3)

The plasma calcium was 13·6 mg. per 100 ml., plasma-phosphorus level 5·8 mg. per 100 ml., and plasma-alkaline-phosphatase 6 King-Armstrong units. In an attempt to assess parathyroid function this patient was given a diet containing only 109 mg. of calcium from days 1 to 7; the urinary excretion of calcium on days 4 to 7 was 222, 206, 209, and 201 mg. This result was considered equivocal. Creatinine clearance was only 17 ml. a minute with the plasma-creatinine 3·4 mg. per 100 ml.: this gross degree of renal impairment rendered useless any further tests for parathyroid function. However, it is of interest that, while the calcium intake was low (fig. 3, days 1–7) the plasma-calcium fell from 13·6 to 11·7 mg. per 100 ml., and the plasma-phosphorus level from 5·8 to 3·9 mg. per 100 ml., but both rose again with return to normal intake.

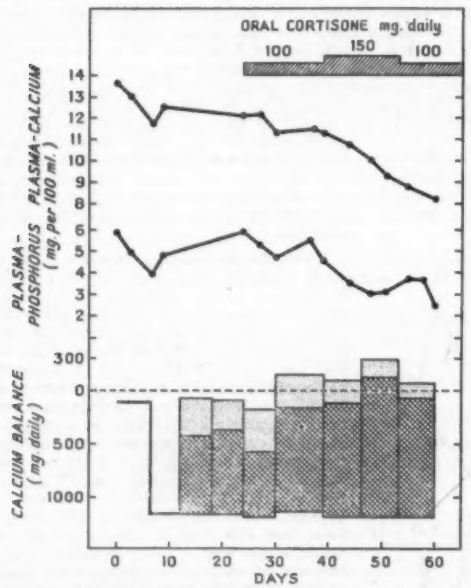

Fig. 3—Case 2: plasma-calcium and plasma-phosphorus levels and calcium balance in relation to cortisone therapy. Intake of calcium is plotted downwards from zero; fæcal calcium (hatched) and urinary calcium (stippled) are then plotted upwards from intake figures.

Liver biopsy revealed a non-caseating granuloma with giant cells, consistent with a diagnosis of sarcoidosis; re-examination of the muscle biopsy taken six years before showed similar granulomas.

Renal biopsy (Dr. H. E. de Wardener) produced a small piece of renal tissue consisting mainly of cortex. The principal abnormality was cloudy swelling and hydropic change in the proximal tubules. In many tubules the lumen was completely filled. The distal tubules showed focal degenerative changes, associated in some areas with foci of calcification in the tubule wall and adjacent interstitial tissue. There was patchy interstitial fibrosis, with scanty chronic inflammatory-cell infiltration. Some of the glomeruli showed pericapsular fibrosis, but others appeared normal.

Cortisone Therapy

Treatment with cortisone was started with the patient on a constant diet. After two base-line periods (days 13–24), during which fæcal calcium averaged 742 mg. a day and urinary calcium 348 mg. a day, oral cortisone acetate 100 mg. a day was given. At this time renal clearances (ml. a minute) were inulin 13, *p*-aminohippurate 44, and phosphorus 10. During the first six days' treatment (days 25–30) fæcal calcium decreased and urinary calcium increased, but thereafter these changes were reversed, and the calcium balance became negative. After thirteen days' treatment (day 38) the plasma-calcium and plasma-phosphorus had fallen to 11·5 and 5·5 mg. per 100 ml. respectively and blood-urea from 180 to 170 mg. per 100 ml. Progress was hastened with increasing cortisone to 150 mg. a day. Fæcal calcium rapidly increased until (days 47–53) it exceeded intake, and urinary calcium decreased to 161 mg. a day; the plasma-calcium and plasma-phosphorus fell to 9·2 and 3·1 mg. per 100 ml. respectively after twelve days on this increased dosage. Cortisone was reduced to 100 mg. a day; fæcal and urinary calcium both decreased, and the plasma-calcium and plasma-phosphorus were finally 8·2 and 2·4 mg. per 100 ml. respectively. The plasma-alkaline-phosphatase level had shown insignificant changes throughout. Meanwhile the blood-urea had fallen steadily to 124 mg. per 100 ml., and renal clearances on day 61 were inulin 23 and *p*-aminohippurate 73 ml. a minute. The blood-pressure was unchanged. The patient was discharged.

Case 3.—A woman, aged 23, had been treated for nearly two years with corticotrophin gel for rheumatoid arthritis. She passed a renal calculus within a few weeks of the onset of therapy but remained free from urinary symptoms for eighteen months. Repeated attacks of pyelitis were then associated with renal calculi. To study the effect of corticotrophin on her calcium metabolism the hormone was withdrawn for thirty days. On a constant intake of 890 mg. of calcium a day the urinary calcium averaged 266 mg. a day. When corticotrophin gel 60 units daily was injected, the urinary calcium increased to an average of 405 mg. a day. The plasma-calcium level fluctuated between 10·1 and 10·8 mg. per 100 ml The plasma-phosphorus level was 4·2 mg. per 100 ml. while the patient was not having corticotrophin, and 2·3 mg. per 100 ml. after seven days' treatment with corticotrophin. Radiography of the lumbar spine showed considerable decalcification.

Case 4.—A woman, aged 34, with idiopathic hypercalciuria and renal calculi. On a constant intake of 860 mg. of calcium a day this patient's urinary calcium averaged 264 mg. a day; when oral cortisone acetate 150 mg. a day was given, the urinary calcium increased to an average of 365 mg. a day. The plasma-calcium level varied between 10·1 and 10·8 mg. per 100 ml. and the plasma-phosphorus level fell during treatment from 3·4 to 3·0 mg. per 100 ml.

Discussion

Hypercalcæmia is an unusual complication of sarcoidosis as appears from table I, which summarises findings from recently published series in which chemical investigations were undertaken. Out of 251 cases the serum-

TABLE I—INCIDENCE OF HYPERCALCÆMIA IN SARCOIDOSIS

Reference	No. of cases	Cases in which serum-calcium was measured	Hyper-calcæmia found
Harrell and Fisher (1939) ..	11	11	6
Robinson and Pound (1950) ..	30	15	1
Small (1951)	4	4	1
Longcope and Freiman (1952)	160	46	10
Weeden and Beckh (1952) ..	34	7	2
Davidson et al. (1954).. ..	6*	6	6
Anderson et al. (1954).. ..	4	4	4
McSwiney and Mills (1956) ..	2	2	2
Total	251	95	32

* Plus 1 case also reported by Longcope and Freiman (1952).

calcium level was measured in 95, and hypercalcæmia was found in 32. Possibly this condition might have been discovered in some of the untested cases; on the other hand, table I includes three series (Anderson et al. 1954, Davidson et al. 1954, and the present cases) selected because of their hypercalcæmia.

Hypercalcæmia is of special importance because it is apparently the chief cause of renal impairment in sarcoidosis (Longcope and Freiman 1952, Klatskin and Gordon 1953, Davidson et al. 1954). The possibility exists here, as with other causes of hypercalcæmia, that renal dysfunction may be arrested or even improved if the plasma-calcium level can be lowered to normal values. In case 1 inulin and *p*-aminohippurate clearances approximated 25% of normal and were unchanged after six weeks' cortisone treatment; but the blood-urea level had fallen from 76 to 47 mg. per 100 ml., and the volume of urine had decreased from 2980 to 2220 ml. a day. In case 2 the inulin and *p*-aminohippurate clearances were about 13% of normal before, and 22% of normal after, five weeks' treatment with cortisone; the blood-urea level fell from 180 to 124 mg. per 100 ml.

The plasma-phosphate level is regularly normal in sarcoidosis when the renal function is not impaired (Longcope and Freiman 1952). In cases 1 and 2 it was raised before treatment. Cortisone produced a fall in plasma-phosphorus level which continued to below normal levels. Part of the fall may have been due to improvement in renal function, but it was greater and quicker than the fall of the blood-urea level. This and its continuation to below normal limits suggest that the fall of the plasma-phosphorus level was due to a specific action of cortisone on phosphorus transfer.

The cause of the hypercalcæmia is not fully established. It is not related to hyperproteinæmia. This was found in 85 of the 197 patients in table II whose plasma-protein levels were determined. Hyperproteinæmia, when present, was nearly always due to hyperglobulinæmia in the cases whose proteins were fractionated, and it is noteworthy that globulins were increased in many patients who had a normal total. Electrophoresis shows that globulin increases usually in the gamma fraction, and there appears to be a relation between the activity of the disease and hyperglobulinæmia. Hypercalcæmia and hyperproteinæmia occur independently of each other in different patients and in the same patient at different times (Harrell and Fisher 1939, Longcope and Freiman 1952). Cases 1 and 2 had normal plasma-protein levels, which remained unchanged during the early phase of cortisone treatment, while the plasma-calcium level was falling to normal.

TABLE II—INCIDENCE OF HYPERPROTEINÆMIA IN SARCOIDOSIS

Reference	No. of cases	Cases in which plasma-protein was determined	Hyper-proteinæmia	Hyper-globulinæmia found
Harrell and Fisher (1939) ..	11	11	8	8
Ricker and Clark (1949) ..	300	40	13	19
Robinson and Pound (1950) ..	30	27	10	14
Small (1951)	4	4	0	4
Longcope and Freiman (1952)	160	91	54	55
Weeden and Beckh (1952) ..	24	22	..	8
McSwiney and Mills (1956) ..	2	2	0	1
Total	541	197	85	109

Hyperparathyroidism is not likely to be an important factor in view of the normal or raised plasma-phosphate level usually found. Harrell and Fisher (1939) found normal calcium-tolerance curves and regarded this as excluding hyperparathyroidism. However, tests of parathyroid function depend on the interpretation of renal responses to diminished intake of calcium (Albright and Reifenstein 1948), to artificial raising of the plasma-calcium level (Howard et al. 1952), or to injections of para-thor-mone (Ellsworth and Howard 1934). The last two tests were made in case 1, the first test was made in case 2, and all the results were equivocal. However, when renal disease is present, the last of these tests usually fails because the tubules lose their ability to respond to para-thor-mone, even when the renal lesion is but slight (Goadby 1937, Goldman and Bassett 1954). It is to be expected that the first two tests, which depend on possible alterations of production of endogenous para-thor-mone, will also be invalid in patients with kidney damage. Dent (1956) has called attention to this aspect of differential diagnosis.

Harrell and Fisher (1939) postulated that hypercalcæmia in sarcoidosis resulted from bone erosion. This can happen but is not found in many cases. Neither of the present cases had clinical or X-ray evidence of bone involvement. The paper of Davidson et al. (1954) is of special interest in this connection; of their seven cases of sarcoidosis with hypercalcæmia and radiologically demonstrable nephrocalcinosis only one had evidence of bone destruction—in a toe.

Anderson et al. (1954) suggested that such cases were manifestations of hypersensitivity to vitamin D, and these workers showed that cortisone lowered the plasma-calcium level at the same time as it decreased the absorption and the urinary excretion of calcium. The decrease of the urinary excretion of calcium presumably depends passively on the removal of the hypercalcæmia. The present cases confirm their findings (see also Henneman et al. 1954, Gleckler 1956). In contrast, the usual action of cortisone (Fischer and Hastrup 1954, Henneman et al. 1955) and corticotrophin (Bartter et al. 1950, 1951) is to increase urinary calcium, as is shown by cases 3 and 4. Bartter et al. postulate that the increased urinary excretion of calcium during corticotrophin therapy may be due to contamination by vasopressin. However, they produced it also with an electrophoretically pure batch of corticotrophin.

The concept that vitamin D and cortisone have opposite effects on calcium metabolism in other diseases besides sarcoidosis finds support from the cases cited by Anderson et al. (1954) and a case described by Papadatos and Klein (1954), whose patient had Addison's disease and hypoparathyroidism and required different maintenance doses of vitamin D as the dose of cortisone varied. Fischer and Hastrup (1954) also demonstrated antagonism between these two steroids in a patient with rheumatoid arthritis.

Finally, although few patients with sarcoidosis have hypercalcæmia, a considerable proportion of patients with hypercalcæmia have sarcoidosis, which should always be considered in the differential diagnosis of hyperparathyroidism. Cortisone appears to offer a useful means of distinguishing sarcoidosis.

Summary

Two cases of sarcoidosis, confirmed by biopsy, with hypercalcæmia and renal impairment were treated with cortisone. The plasma-calcium and plasma-phosphorus levels fell during treatment.

Calcium balance was studied in one of these cases; fæcal calcium increased, and urinary calcium decreased. By contrast, cortisone and corticotrophin in two cases with normal calcium metabolism caused increased urinary excretion of calcium.

In both cases of sarcoidosis there was evidence of improvement of renal function when the plasma-calcium level fell.

The possible causes for hypercalcæmia in sarcoidosis are briefly discussed.

We thank Prof. F. T. G. Prunty, who was in charge of these patients in St. Thomas's Hospital, for his encouragement and advice; Dr. J. L. Pinniger for his opinion on the liver biopsies; Dr. M. S. R. Hutt for his opinion on the renal biopsy; and Miss P. Scimssen, sister of Holden metabolic ward, and Miss E. R. Skinner, sister dietitian, who ably collected the balance data.

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LEPTOSPIRA CELLEDONI

A NEW LEPTOSPIRAL SEROTYPE

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IN an article on the treatment of leptospirosis in Malaya with antibiotics Fairburn and Semple (1956) mention *Leptospira celledoni* and infer in a footnote that the serotype was given this name by Smith et al. (1954). The latter authors intentionally used the term "Celledoni" type, because no details of the serological relationships of the serotype had yet been published. Up to now 9 strains of the "Celledoni" type have been isolated in Australia (Queensland 1955) and 6 in Malaya (Broom, unpublished).

It seems advisable to report the appropriate details briefly now, to prevent the confusion which would arise if other workers described this serotype under a different name, which is not an impossible or even an unlikely contingency. From time to time in the past new names have been introduced into the literature without any indication of the serological affinities of the strains so designated. As a result, antigenically identical strains isolated in different localities have been regarded, sometimes for a long time, as separate serotypes. We here plead that new serotypes be not created until their serological characters have been fully investigated, and that the data be published when the name is first used.

TABLE I—AGGLUTINATION REACTIONS OF PATIENT'S SERUM AT DIFFERENT STAGES

Antigen	Agglutination titre: Days after onset				
	5	19	27	239	701
L. icterohæmorrhagiæ ..	0	30	30	0	0
L. canicola	0	10	10	0	0
L. australis B	0	0	10	0	0
"Celledoni" strain	0	100	300	10	0

Titres are expressed as the reciprocals of the serum dilutions.

Original Isolation

The first strain of the "Celledoni" type was isolated on Jan. 28, 1952, in a blood-culture made from a white boy aged 18. Before his illness the boy had been working on his father's sugar-cane farm at Mourilyan, North Queensland, Australia.

Clinical Notes.—The patient first felt ill on Jan. 24, 1952, and later complained of feverishness, shivering, nausea, severe frontal headache, soreness behind the eyes, and a tender lump in the left groin. He was admitted to the Innisfail District Hospital on Jan. 28, 1952. On examination his temperature was 102·2°F, his liver was slightly tender, but neither his liver nor his spleen was palpable, and his left inguinal lymph-glands were enlarged and tender. Leptospirosis was diagnosed on clinical and epidemiological grounds, and oxytetracycline therapy was begun. The boy's temperature fell to normal next day (Jan. 29), and his condition rapidly improved. He was discharged from hospital on Feb. 11, 1952.

Serological Findings.—Agglutination tests were made on samples of the patient's serum taken at intervals after the onset of symptoms, and the results are set out in table I. It will be noted that the agglutinin titre against the homologous strain reached only 1/300 at the end of the fourth week, and that no antibodies were detected in the sample taken about a year and ten months after recovery. Wolff (1954) stated that a rapid fall of antibody titre to zero had been recorded in leptospirosis in Indonesia. He could not explain this finding, but observations in natural and experimental infections of rodents with *L. hyos* suggest that this serotype has a low capacity for stimulating the production of antibody in rodents (Gordon Smith and Broom, unpublished). It may therefore be that some of the serotypes which cause the milder forms of leptospirosis do not act as very efficient antigens.

Serological Investigation

To establish the identity of the "Celledoni" type we compared its serological characters with those of the 32 "recognised serotypes" into which Wolff and Broom (1954) divided the genus Leptospira. Two series of agglutination tests were made:

(1) Living cultures of strain "Celledoni" were tested against antisera prepared against the type strains of each of the recognised serotypes.

(2) Conversely, an antiserum for strain "Celledoni" was tested against living cultures of all the other serotypes.

The serum-antigen mixtures were incubated for four hours at 30°C, and the readings were made by dark-field microscopy in the usual way.

Results

Positive agglutination titres of 0·1% or more of the homologous antiserum titres were obtained only with

TABLE II—CROSS-AGGLUTINATION REACTIONS OF STRAIN CELLEDONI

Antigen	Cross-agglutination titres of antisera		
	"Celledoni"	*L. javanica*	*L. poi*
"Celledoni"	100	0·3–1·0	0·1–1·0
L. javanica	0·3–1·0	100	33–100
L. poi	1·0	100	100

Titres are expressed as percentages of the titres of the antisera with their homologous strains.

L. javanica and *L. poi* (see table II). The reactions with all the other serotypes were either negative or positive to less than 0·1% of the homologous titres.* Since the cross-titres with *L. javanica* and *L. poi* were less than 10%, it was unnecessary to do cross-absorption tests to establish the "Celledoni" type as a separate serotype.

Conclusion

We consider that the "Celledoni" strain represents a new leptospiral serotype, and we propose for it the name *Leptospira celledoni*, which had already been used by Fairburn and Semple (1956) to designate this serotype.

Summary

A description is given of the isolation and the serological reactions of a new leptospiral serotype distantly related antigenically to *L. javanica* and *L. poi*.

The name *Leptospira celledoni* is proposed for it.

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THE STABILITY OF CHRISTMAS FACTOR
A GUIDE TO THE MANAGEMENT OF CHRISTMAS DISEASE

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CHRISTMAS disease was originally described in this country by Biggs et al. (1952) and in America by Aggeler et al. (1952), who named the deficient factor plasma-thromboplastin component (P.T.C.).

The work of Biggs et al. (1952) was based on the findings in seven patients, all of whom presented the clinical features of classical hæmophilia. Improved techniques enabled them to demonstrate that the absent factors in their patients differed in many ways from antihæmophilic globulin (A.H.G.). Whereas both Christmas factor and A.H.G. are present in plasma, only the former is found in serum, the A.H.G. having been utilised in the process of clotting. Several other striking differences were observed, not the least of these being that A.H.G. was unpredictably (usually remarkably) labile under normal storage conditions, whereas Christmas factor was stable. But these workers neither defined the degree of stability nor gave any experimental details upon which this conclusion was based. One of their more severely affected patients was transfused, before operation, with stored plasma, but details of storage—e.g., temperature and age—are not given; nor is the anticoagulant used in the plasma mentioned. The result was most satisfactory. All in-vitro coagulation tests became normal, including thromboplastin generation, and surgical procedures were completed with minimal bleeding. Later this patient was required to undergo a further operation, and on this occasion a transfusion of "fresh" serum was given, after which all in-vitro coagulation tests became normal except the thromboplastin-generation test, which remained grossly abnormal, and at operation the patient bled severely. Commenting on this, Biggs et al. (1952) suggest that "stored blood may be a more effective treatment for Christmas disease than quite fresh blood."

Aggeler et al. (1952) and White et al. (1953) are no more informative. Though the properties of P.T.C. are described in great detail, the stability on storage is not mentioned. It was noted, however, that severe bleeding episodes in their patients "were rapidly controlled by transfusions of whole blood, fresh or frozen plasma, or freshly lyophilised plasma." These workers do not appear to have used serum transfusions. Later Aggeler et al. (1954) state that "P.T.C. deficiency can also be treated with moderately aged plasma, and with serum," but this statement is not amplified.

Stefanini (1954) observes that the clotting mechanism of cases of P.T.C. deficiency may be corrected by the addition of stored or fresh plasma or by serum, and that P.T.C. is "very stable" on storage.

We are left with the impression that Christmas disease is a much less trying problem for the clinician than is hæmophilia, because he is no longer faced with the difficulty of obtaining a stream of donors to supply fresh blood for transfusion, since stored blood, plasma, and serum are equally useful. A search of the published reports does nothing to alter this impression, and in practice the idea is easily perpetuated if adequate tests are not made. The following case illustrates this:

A male "hæmophiliac" was admitted to this hospital with a hæmorrhagic episode. His clotting mechanism was fully investigated, including the thromboplastin-generation test, which revealed that he was a case of Christmas disease. A transfusion being necessary it was decided to use reconstituted (dried) serum. A specimen of the patient's plasma at this stage gave a calcium clotting-time of 12 minutes (normal 1–4 minutes), but the addition of 1/10 vol. of serum reduced the calcium clotting-time to 4 minutes. This was considered sufficient evidence to justify the use of the serum. After the transfusion, however, the patient's condition did not improve and he continued to bleed. The calcium clotting-time of his plasma was now 3 minutes 40 seconds, but the thromboplastin generation remained grossly abnormal. After a second transfusion, this time with "absolutely fresh" serum (kindly provided by Dr. W. Jenkins of the blood-transfusion centre at Brentwood), the patient's bleeding ceased. Thromboplastin generation was now rather better but still well below normal.

What then is the method of choice in handling these cases? Is the transfusion of stored blood or its fractions likely to prove as effective as the use of fresh blood in any particular case?

The answer to these questions hinges upon the stability of Christmas factor, and the present work is an attempt to study this problem under normal conditions of storage and to offer a guide to the practising clinician.

Methods

The sources of Christmas factor studied were:

(1) Normal blood-bank plasma (anticoagulant disodium citrate) stored at +4°C.

* The other serotypes used in the test were:

L. andaman A	*L. djasiman*	*L. paidjan*
L. australis A	*L. grippotyphosa*	*L. pomona*
L. australis B	*L. hardjo*	*L. pyrogenes*
L. autumnalis	*L. hebdomadis*	*L. sarmin*
L. ballum	*L. hyos*	*L. saxkoebing*
L. bangkinang	*L. icterohæmorrhagiæ*	*L. schüffneri*
L. bataviæ	*L. mankarso*	*L. sejroe*
L. benjamin	*L. medanensis*	*L. semarang*
L. canicola	*L. muenchen*	*L. sentot*
L. cynopteri	*L. naam*	*L. wolffi*

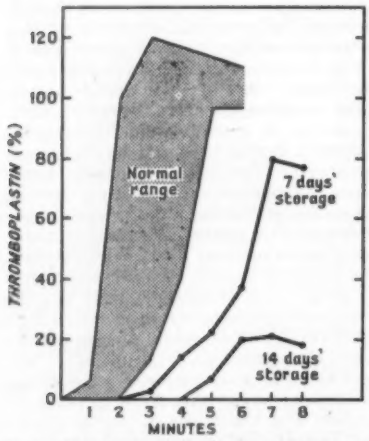

Fig. 1—Thromboplastin-generation test; effect of storage at + 4°C on Christmas factor in blood-bank plasma (anticoagulant disodium citrate).

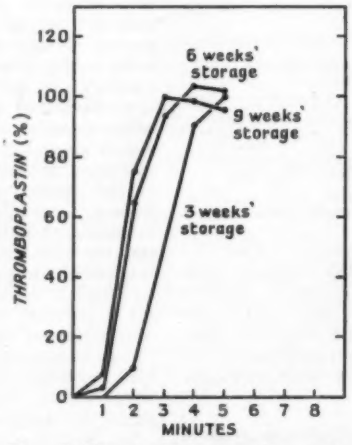

Fig. 2—Thromboplastin-generation test: effect of storage at +4°C on Christmas factor in trisodium-citrate plasma (normal range as in fig. 1).

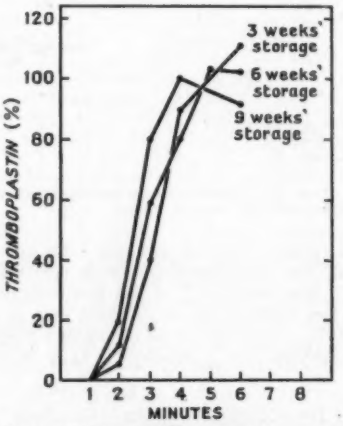

Fig. 3—Thromboplastin-generation test: effect of storage at −20°C on Christmas factor in trisodium-citrate plasma (normal range as in fig. 1).

(2) Plasma (prepared by taking blood into 3·8% trisodium-citrate solution) stored at +4°C and −20°C.

(3) Normal serum stored at +4°C and −20°C.

(4) Reconstituted (dried) plasma and serum (several samples chosen at random at different times).

The thromboplastin-generation test (Biggs and Douglas 1953) was used as the means of comparative assay, the material under investigation being substituted into a coagulation system all of whose elements except the Christmas factor were provided. The source of factor VII was fresh serum from a known case of Christmas disease.

Throughout the experiment every care was taken to avoid bacterial contamination of stored samples, and sterility was checked at all stages.

Results

Figs. 1–6 show that:

(1) When acid-citrate dextrose plasma (blood-bank) is the source of Christmas factor (fig. 1), thromboplastin generation falls off rapidly within 14 days and is probably within normal limits for the first 4 days only. This, however, compares favourably with A.H.G., which often disappears within 48 hours.

(2) When the anticoagulant used is trisodium citrate, the content of Christmas factor appears not to diminish at all over a period of 9 weeks, whether storage is at +4°C (fig. 2) or at −20°C (fig. 3).

(3) The behaviour of Christmas factor in serum is much affected by the temperature of storage. At +4°C thromboplastin generation falls off rapidly (fig. 4) and after 3 weeks is extremely low. At −20°C deterioration is negligible after 9 weeks (fig. 5).

(4) Dried products show a uniformly diminished thromboplastin generation, but the values obtained with plasma are rather higher than with serum (fig. 6).

Discussion

This investigation confirms the opinion of other workers that Christmas factor is more stable than antihæmophilic globulin. But stability is a relative property and should be accurately defined. The bald statement that Christmas factor is stable is misleading, as is evident in the somewhat hazy approach of many clinicians to the management of these cases. Although every effort is made to obtain fresh blood for the transfusion of hæmophiliacs, the patient with Christmas disease is apt to receive

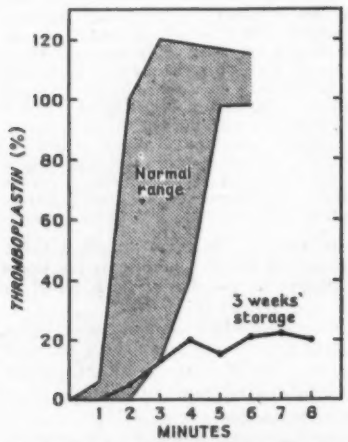

Fig. 4—Thromboplastin-generation test: effect of storage for 3 weeks at +4°C on Christmas factor in serum.

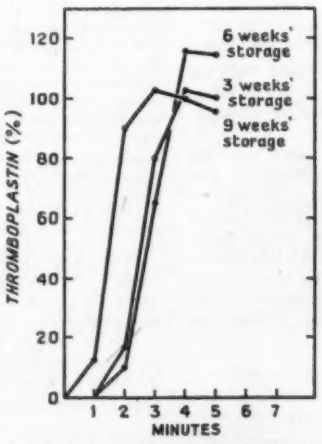

Fig. 5—Thromboplastin-generation test: effect of storage at −20°C on Christmas factor in serum (normal range as in fig. 1).

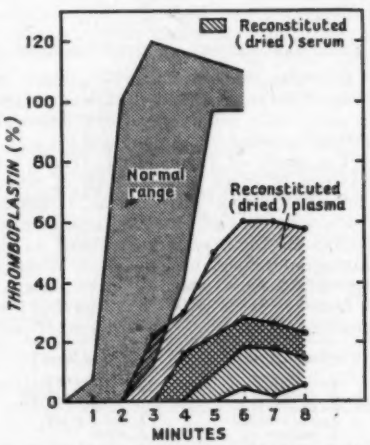

Fig. 6—Thromboplastin-generation test: results obtained (showing amount of Christmas factor present) in reconstituted (dried) plasma and in reconstituted (dried) serum.

whatever is nearest at hand, either stored blood (of any age) or even reconstituted plasma or serum.

That many workers have in fact procured hæmostasis by using stored blood fractions is not really surprising, since the Christmas-factor content of stored plasma may be quite moderate and, provided the transfusion is sufficiently large, the deficiency may be rectified to an extent which will allow clotting to take place. Alexander (1955) states that "an antihæmophilic factor level of approximately 10–20% of normal will assure normal clotting." If this were also true of Christmas factor, a transfusion of only two bottles of plasma, each of 50% Christmas-factor content, would be necessary to remedy a severe deficiency. But the potency of stored plasma and serum is often considerably less than 50%, and in such circumstances moderate transfusions are unlikely to initiate hæmostasis. Our own experience suggests that such occurrences are common, but they have not hitherto been published.

The preparation of a patient with Christmas disease for major surgery, in the absence of complete laboratory control, may be hazardous. The clotting-time may be corrected in vivo and in vitro by stored or reconstituted plasma or serum. Fortified with this information and his "knowledge" of the stability of Christmas factor the the surgeon is encouraged to take a bold line and may soon find himself in difficulty.

It is of first importance, therefore, that a clear guide should be offered to clinicians who might be faced with such an emergency. Such, we believe, is to be found in our conclusions (see below).

Our results indicate that the stability of Christmas factor in plasma and serum is influenced by both temperature and pH. At −20°C stability is maximal, there being no deterioration after 9 weeks' storage. At this temperature pH is of no importance. At +4°C the factor is more labile and pH is important. In the presence of trisodium-citrate solution (pH 8) stability is good; but, if a solution of the acid salt is used (pH 5), deterioration is greatly accelerated. This sensitivity to pH has been noted by other workers (van Creveld and Paulssen 1953). Why the factor is so unstable in serum at this temperature is not clear.

The stability of Christmas factor in dried-blood fractions has not been investigated. We have attempted merely to assay the content of random samples; this we found to be uniformly low. Probably little deterioration takes place after drying, the final content depending on the age of the original plasma or serum and the conditions under which it was stored.

Conclusions

It is reasonable to judge the in-vivo efficacy of a source of Christmas factor by its ability to take an effective part in the generation of thromboplastin in vitro. On this premise we base the following conclusions:

(1) In the management of Christmas disease, as in hæmophilia, the use of absolutely fresh blood, plasma, or serum for transfusion must remain our first choice.

(2) In an emergency, blood and plasma stored at +4°C for less than 7 days may be used and is likely to prove adequate.

(3) Under present conditions the use of reconstituted (dried) plasma or serum should be avoided.

Fresh serum stored at −20°C is an excellent source of Christmas factor, and small stocks could with advantage be kept by transfusion units. There is also a good case for the preparation of absolutely fresh freeze-dried serum or plasma which could be made available to all hospitals, since this substance is likely to retain its potency (A.H.G. as well as Christmas factor) indefinitely. The use of a neutral anticoagulant should prevent deterioration in the early stages.

Summary

The content of Christmas factor in plasma and serum and its stability under different conditions of storage were studied by the thromboplastin-generation test.

On the basis of these findings a guide to the management of Christmas disease is offered.

We wish to thank Dr. W. W. Walther for his advice and help in presenting the material of these investigations.

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ORAL DIBENYLINE IN DISTAL SENILE OBLITERATIVE ARTERITIS

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THE symptoms of obliterative arterial disease are due to diminished blood-supply. It therefore appears logical to expect a peripheral vasodilator to alleviate those symptoms.

Many such compounds have been developed, and their history has been similar: unselected patients have been treated indiscriminately, and the results have been assessed after an arbitrary time, usually on clinical impressions; and in some series there has been a preponderance of successful results and in others of unsuccessful. The published reports have therefore been some favourable to the drug and others unfavourable The final result is the apathetic use of these drugs by the average medical practitioner for lack of alternative treatment, followed by a pleasant surprise when the outcome is success.

A fundamental mistake, which is only too frequently made, is failure to recognise that intermittent claudication, ischæmia, and gangrene are the end-results of numerous underlying causes. The cause of gangrene may not even be any form of obliterative arterial disease but local infection. Many an elderly patient must have had a leg amputated which could have been saved by active treatment of the infection. Reasonable success with any form of treatment of obliterative arterial disease can be achieved only by investigating the underlying cause, assessing the severity, and understanding the life-history of the condition.

A major factor which may militate against success in the use of a vasodilator is the degree of arterial obstruction in the limb as a whole. No amount of peripheral vasodilatation can produce an adequate blood-flow if a main vessel is blocked and the collateral circulation is poorly developed. Opening the taps wider will not alter the rate at which the bath fills, if the water is turned off at the main. The effect of a vasodilator will depend on the degree of arterial obliteration in each patient. In the distal type of senile obliterative arteritis, however, the underlying condition is such that a high percentage of success may be expected.

Distal senile obliterative arteritis is chiefly seen in the elderly but occurs also in the third and fourth decades. In young people it may be distinguished from juvenile obliterative arteritis (Buerger's disease) by the absence of patchy superficial phlebitis and fungus infection (Boyd et al. 1949). The arteriosclerotic changes are mainly limited to the periphery, and the more proximal vessels

are rarely seriously affected. The condition is typified by chronic ischæmia confined to the extremities, and there is little evidence of any proximal spread of the occlusive process. In old people local exacerbations lead to " attacks " of superficial gangrene. These are followed by periods of quiescence and recovery. The condition rarely leads to more than superficial necrosis or the loss of the terminal phalanges of the toes. The distribution of the ischæmic changes is often symmetrical. The hands are usually involved and often may be more obviously affected than the feet; Raynaud's phenomenon in the hands may even be the main symptom.

From a clinical point of view the recognition of this group is extremely important. The sudden onset of ischæmic changes in the feet of elderly patients is apt to be regarded as hopeless, whereas the distal type of arteriosclerosis responds dramatically to therapy. The most successful treatment is undoubtedly sympathectomy, but this is not always desirable in the elderly. Most vasodilators act only for a short time and often affect both the parasympathetic and the sympathetic nervous systems. The action of ' Dibenyline ' is limited to the periphery and is long-lasting. It was these properties which prompted the present investigation.

Dibenyline

Dibenyline is N-phenoxyisopropyl-N-benzyl-β-chloroethylamine hydrochloride and is a member of a β-haloalkylamine series typified by the earlier ' Dibenamine.' This group of compounds exert a highly specific action, blocking the peripheral motor action of adrenaline without altering its inhibitory and cardiac effects. The site of action is the neuro-effector junction, and the block lasts a long time. Although the β-haloalkylamines have been used in pharmacological investigations they have had little clinical application, because those used before the introduction of dibenyline had the disadvantage of being ineffective when given by mouth.

The action of dibenyline takes place in two phases: (1) a loose combination with the adrenaline receptor appears to be formed, because the degree of block depends on the relative amounts of adrenaline and dibenyline present; and (2) the receptor is thought to be permanently inactivated by the formation of a stable combination with an ethylenimmonium compound produced as a breakdown product of dibenyline. In this second phase the block remains effective against doses of adrenaline which would normally be lethal.

Dibenyline has been comprehensively reviewed by Goodman and Gilman (1955), and reference should be made to their report for details of its properties and uses.

Selection of Patients

The severity of distal senile obliterative arteritis depends on the general arterial state, and the symptoms will vary accordingly. The arterial degeneration can be considered in three stages, and the severity of the disease can be graded from these as mild, moderate, or severe:

(1) *Mild.*—In the first stage of arterial degeneration there is generalised narrowing of the distal arteries from arteriosclerosis but there is no thrombosis of the digital vessels. The patient's main complaint is usually excessive coldness of the hands and feet, with numbness of the fingers and toes. Raynaud's phenomenon may occasionally be present, especially in cold weather; it can usually be relieved by warmth. There are no nutritional changes in the skin and nails. The reactive-hyperæmia test gives either a normal or a slightly delayed response.

(2) *Moderate.*—In the second stage there is patchy thrombosis of the digital arteries. This stage is characterised by nutritional changes in the skin, and the nails are brittle and often deformed. The fingers appear tapered, and, particularly in winter, the skin may crack, leading to painful finger-tips and paronychia. There is a delayed response to the reactive-hyperæmia test, and there may be no apparent response in the finger-tips.

(3) *Severe.*—In the third stage there is extensive thrombosis of the digital arteries. This stage is characterised by gangrene and ulceration of the fingers.

Oral therapy with dibenyline is used as the primary treatment in the mild and moderate cases, where the degree of vasodilatation which can be expected should be sufficient to improve the condition. In the severe case it is essential to obtain the maximal dilatation of those vessels which remain patent; in the past this was achieved by sympathectomy. More recently dibenyline has been administered intra-arterially in severe cases, and the experiences with this form of therapy will be reported later.

Method of Treatment

It is advisable to build up the dosage of dibenyline gradually until the appropriate level is reached.

The starting dosage was one 10-mg. capsule at night for the first three days, after which one capsule was given night and morning. At the end of a week's treatment the dosage was increased to one capsule three times daily. The patient was usually reviewed within a month of starting treatment, and, if necessary, the dosage was gradually increased to a maximum of 60 mg. daily.

In a few instances in the moderate group the dosage was increased by 20-mg. steps until a total of 60 mg. daily was reached.

Assessment of Results

Since the assessment of results was based on clinical observations, an arbitrary classification, based on strict criteria, was adopted.

For the result to be classed as good, a mild case has to obtain complete symptomatic relief, and a moderate case has to have good nutritional improvement with the complete healing of any lesion and relief of pain.

For the result to be classed as fair, a mild case must obtain almost complete relief of symptoms, and a moderate case must show nutritional improvement, much improvement of any lesion, and alleviation of pain.

All other results are classed as poor.

Results

In the present series 30 patients with distal senile obliterative arteritis were observed long enough for a clinical assessment to be made. The patients were aged 29–75, and there were 8 males and 22 females. In 17 patients the condition was mild and in 13 moderate. The results of treatment are summarised in table I.

TABLE I—RESULTS OF TREATMENT

Grade of disease	Results of treatment		
	Good	Fair	Poor
Mild	12	3	2
Moderate ..	6	6	1

All the patients in whom the results were either good or fair were seen in review clinics for six months or more. The 3 patients in whom the results were poor had treatment discontinued before six months, and their cases are discussed below.

Unwanted Effects

Drugs which affect transmission in the autonomic nervous system are bound to produce unwanted effects as a natural consequence of their action. The action of dibenyline is restricted to a limited part of the sympathetic division, but, even so, unwanted effects develop during treatment. The severity of such unwanted effects is subjective and has been classed accordingly: mild if they were not troublesome to the patient; moderate if the patient found them unpleasant but wished to continue

TABLE II—UNWANTED EFFECTS IN RELATION TO LARGEST DAILY DOSAGE

Daily dosage (mg.)	Unwanted effects			
	Nil	Mild	Moderate	Severe
40 or less	10	3	3	0
40 + ...	8	1	3	2

treatment; and severe if the patient wanted to discontinue treatment. Table II summarises the unwanted effects in relation to the largest daily dosage of dibenyline.

12 patients complained of unwanted effect, and 4 had more than one unwanted effect: 5 complained of dizziness, 4 of drowsiness, and 4 of stuffiness of the nose; and 1 had nausea on a daily dosage of 60 mg. and stopped taking the capsules after nine days. Treatment was discontinued in another case, after eleven months on 60 mg. daily, because the patient felt depressed. Whether the depression was attributable to the treatment is a matter of conjecture, but the case has been included because of our limited experience with dibenyline.

Discussion

The pattern which emerges from this investigation is what was expected: the best results were obtained where the blood-supply to the extremities was least restricted. The patients whose main complaint was coldness and numbness of the hands and feet obtained complete relief in every case. This improvement could not be attributed to warmer weather, because cessation of treatment was sometimes followed by a return of symptoms even in summer.

Some of the results in the moderate group were striking: for example, a woman, aged 71, with severe nutritional changes in her hands and necrosis of the tips of both index fingers, was greatly improved after three months' treatment with 60 mg. daily, the necrotic areas being completely healed. Good results were also obtained in other patients with ulcerated fingers.

There was a similar pattern in secondary Raynaud's phenomenon: usually patients with mild disease who experienced transient attacks obtained complete relief, and those with moderate disease found that the attacks became much less frequent.

In addition to the patient who gave up treatment after nine days because of nausea, 2 others were classed as showing a poor result: a woman, aged 39, who had had bilateral cervical and lumbar ganglionectomy without effect; and a woman, aged 29, who had Raynaud's phenomenon and severe rheumatoid arthritis.

The incidence of unwanted effects is a warning against the haphazard use of dibenyline. In some instances a slight reduction of the dosage considerably decreased the unwanted effect. Where troublesome effects are experienced, the benefit obtained from the treatment must be weighed against the discomfort caused. It may even be necessary to stabilise the dosage at a level below that producing most improvement.

Conclusions

Although further experience may modify the criteria of selection of patients for treatment, the following general conclusions may be drawn from the present investigation:

(1) The results in the mild grade of distal senile obliterative arteritis were extremely good, and most of the patients obtained complete symptomatic relief. Dibenyline therapy is therefore the first choice for this grade.

(2) In the moderate grade the results were comparable with those of sympathectomy in patients for whom operation was indicated. Because of this, dibenyline therapy should always be tried before resorting to sympathectomy.

(3) Care must be exercised in adjusting the dosage to keep unwanted effects to a minimum.

Summary

30 patients with distal senile obliterative arteritis were treated with oral dibenyline. Good results were obtained in 12 of 17 mild cases and in 6 of 13 moderate cases.

Dibenyline is the preferred treatment for the mild grade and offers an alternative to sympathectomy for many patients in the moderate grade.

I wish to thank Dr. Kenneth Carter and Messrs. Smith, Kline, and French International Company for the supplies of dibenyline.

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THE RECENT HISTORY OF CORROSION IN METAL USED FOR INTERNAL FIXATION

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ABOUT 1950 an outbreak of metal corrosion was noticed at Birmingham Accident Hospital in fractures treated by plating. The full extent is unknown, but some idea of the incidence can be gained from the series of fractured tibiæ treated by plating during the subsequent three years. Of the 56 in which stainless steel was used there was gross pitting corrosion in 24. These known cases were the ones serious enough to require a second operation and removal of the offending metal. There were others in which the diagnosis was almost certain but in which the effects were not severe enough to require removal of the plate. Thus the incidence among stainless-steel platings was certainly over 40% and may have been as high as 60%.

The real cause of the outbreak was not at first recognised, but suspicion was aroused when it became clear that one sort of screw was always involved. This was the fine-thread Sherman type (see figure). Although plates were occasionally affected when in contact with a corroding screw they often escaped. The screws were labelled "non-toxic," however, and the suppliers, a reputable firm, repeatedly assured us that the metal had been "passivated" and "electrolytically polished" and that it responded satisfactorily when "tested with a microammeter"; so suspicions were lulled. Furthermore it was suggested that we might be "damaging the surface film" in sterilising or might be scratching it when inserting the screw, and efforts were made to remedy this, although, of course, metal that will not stand ordinary handling is quite useless for surgery. Another reason for delay in discovering the cause was that the signs and symptoms of the tissue reaction due to corrosion are identical with those of sepsis, being truly an inflammation although of chemical and not bacterial origin; and a long time was wasted in fruitless attempts at tightening up aseptic régime and in the administration of antibiotics.

Eventually specimens were sent for independent analysis, and it was found that the screws were made of a stainless steel called E.M.S. (see appendix).

The events leading up to the outbreak, it is now known, began when the firm of suppliers received complaints about the clarity of the thread on their fine-thread screws. This firm, which made all its own internal fixation apparatus except screws, was aware of the necessity for using a stainless steel (British orthopædic surgeons were, and still are, at fault in not specifying

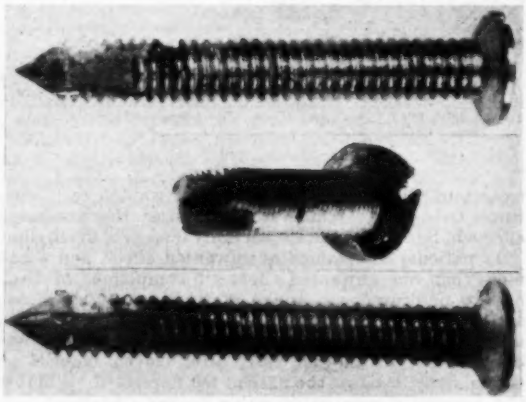
which of the many varieties they must have), and a fairly satisfactory one called F.S.L. (see appendix) had been supplied for years. The screws, which were obtained ready-made from a large firm of screw manufacturers, were only finished by the suppliers. They had presumably originally been ordered in the same steel. When the complaints about the thread were handed on to them, however, the manufacturers corrected the fault by the simple expedient of substituting E.M.S., which has "free machining" properties. Serious consequences of the change were presumably not expected by the manufacturers, and surgeons continued to use the screws, unaware that any change had been made. This all took place in 1950.

In the middle of 1954, after our investigations, the firm stopped supplying E.M.S. screws. Meanwhile, for four years hospitals all over the country and probably overseas, wherever this firm's products had been bought, had been receiving plates of one metal and, sometimes, screws of another, the particular combination of F.S.L. and E.M.S. having a 40–60% corrosion-rate. The number of E.M.S. screws sold in that time was nearly 6900. Evidence suggests that corrosion had occurred widely during this period: for instance, Bowden et al. (1955) say that "over the course of the last few years . . . something appears to be making non-toxic metal toxic." Reports from places as distant as Borneo, Cambridge, Canada, and New Zealand tell of trouble with screws answering to the description, and a recent article from Manchester (Axon and Wright 1956) is based on experiences with screws of this type.

It therefore seemed necessary to find out how far the bad metal had become incorporated into theatre stocks, and a small survey was made in the Midlands and in London. An amazing collection of metals was discovered ready for use in some places. At the first hospital visited there was almost no stainless steel at all, but there was a box containing about 4 lb. of plates of ordinary steel dating from before the "stainless" era and quantities of soft iron wood-screws. However, very little plating was done here. Four different steels were identified at each of two other hospitals. Less than half of those visited pursued a policy that was completely safe, and only a small proportion had completely overhauled their stocks within the theatre sister's memory. The object of the search, E.M.S., was discovered in use or only recently discarded or only temporarily put on one side in five out of seventeen hospitals. The fault lies partly with the hospitals, which cling on to, and even re-use, their old stocks of metal, and partly with the suppliers, who have so often in the past omitted to specify which steel they have been using, and whose changes from one steel to another have been unannounced. This state of affairs is typical of the loose control over orthopædic materials in this country.

In the light of modern knowledge it is careless to the point of negligence for any metal other than F.S.L., molybdenum steel (see appendix), or 'Vitallium' ('Vinertia') to be used in a patient, and the responsibility is the surgeon's. Many second and even third and fourth operations were necessitated in our series entirely because of corrosion; there were delays in union and non-union probably due to it, and a considerable amount of pain and distress from wounds which remained open for months or years. Another unfortunate result is that research-workers are investigating abstruse causes for corrosion, such as metallic transfer from screwdrivers, without realising that their own clinical cases of corrosion have probably been due to E.M.S.

In view of these facts it becomes incumbent on all hospitals to check their theatre stocks. The equipment is simple, consisting of a strong magnet and a bottle of a test reagent named 'D.L. 12.'[1] It is not difficult to differentiate between strongly magnetic, feebly magnetic, and non-magnetic steels. Ordinary steel, vanadium steel, and chrome steel (see appendix) are strongly magnetic and are highly corrodible; in fact there is no safe metal that is strongly magnetic. Therefore any item that is picked up with a click when the magnet is passed over the box must be thrown out. Some Smith-Petersen nails acquired during the war will be found to be of chrome steel and are not fit for use. The stock of one London hospital was found still to include about 25% of chrome-steel nails, and the badly corroded nail illustrated by Collins (1953) was one of these. D.L. 12 is a test for molybdenum in steel. A spot of this fluid placed on the metal turns brown if there is a useful amount of molybdenum present. All such items can be considered safe by present standards. There remain the steel items that are feebly magnetic or non-magnetic and molybdenum-negative; this group includes all that are made of F.S.L. and E.M.S. There are slight differences between the magnetic properties of these two steels in many cases, but no clear differentiation can be made without a full analysis. Further aids to identification are the type of screw and the date of purchase.



E.M.S. screws showing corrosion.

At the Accident Hospital the whole of the old theatre stock of steel was scrapped in 1954, and molybdenum steel was substituted. If all other hospitals followed this example they would find, as we have done, that corrosion has almost completely ceased to exist as a clinical problem.

The statement that molybdenum steel and vitallium (vinertia) are safe has been made with slight reservation. Increased awareness of the condition has led to the occasional recognition of mild corrosion-like reactions even with these supposedly safe metals. The possibility of micro-corrosion causing tissue reaction or predisposing to secondary infection is not excluded, and with molybdenum steel there have even been a very few minor cases of visible pitting. This is to be discussed more fully elsewhere. To preserve a proper sense of proportion, however, we should accept this as a minor problem at present, and priority should be given to getting rid of theatre stocks of ancient metal.

We are indebted to Mr. J. B. P. Williamson, M.A., for advice on certain metallurgical points.

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APPENDIX

The popular names for steels mentioned in this paper are used as follows:

1. Obtainable from W. R. Howard and Partners Ltd., 82, Victoria Street, London, S.W.1.

F.S.L. refers to steel of British Standard specification En 58E, which is one of the group of stainless steels of about 18% chromium, 8% nickel composition.

E.M.S. refers to B.S. specification En 58M, a stainless steel similar to the group above but containing a comparatively high proportion of manganese.

Molybdenum steel refers to stainless steels of the 18–8 basic composition with 2–4% of molybdenum, B.S. En 58J. F.M.B. and 18–8 SMo are members of this group.

Chrome steel refers to the group of stainless steels containing 12–16% chromium but no nickel. There was a period during the 1930s when this and F.S.L. appeared to be used indiscriminately under the title stainless steel.

Vanadium steel refers to one of a group of non-stainless steels containing about 0·1% vanadium and small quantities of various other elements.

DIVERTICULOSIS OF THE SMALL INTESTINE WITH STEATORRHŒA AND MEGALOBLASTIC ANÆMIA

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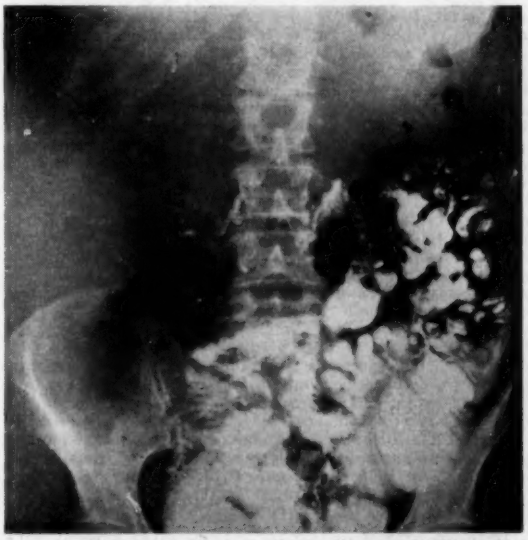
THE triad of jejunal diverticulosis, steatorrhœa, and megaloblastic anæmia has been infrequently reported, though it may be not uncommon. When Badenoch et al. (1955) described four cases, of which they had briefly reported two before (Badenoch and Bedford 1954), they were able to find only one other published case—that of Dick (1955). Subsequently Friedlander and Gorvy (1955), dealing primarily with steatorrhœa, briefly mentioned another. A seventh patient exhibiting this triad is reported here.

Case-report

A housewife, aged 60, first attended as an outpatient in November, 1954, with numerous symptoms, of which dyspepsia seemed to be the most troublesome. No abnormalities were found on physical examination except that her tongue was smooth at the edges, although it was not sore. It was thought that she might be psychotic, but a barium-meal revealed a hiatus hernia and rapid transit of the opaque meal, which reached the transverse colon in two hours; no other abnormality was reported. Free acid was present in the stomach. The patient was not anæmic: Hb 13·6 g. per 100 ml., packed-cell volume 42%. She was advised to sleep with three pillows and to take 'Aludrox.' Two months later she was much better and was referred back to the care of her own practitioner.

A year later, in November, 1955, she was admitted to hospital almost moribund. She had had anorexia for eight months and had lost a stone in weight. For a few months she had had diarrhœa, passing four or five watery motions, containing neither mucus nor blood, each day. For three weeks she had had bouts of nausea and vomiting, accompanied by generalised colicky abdominal pain (which had been occurring intermittently for two years).



Numerous diverticula in jejunum and upper ileum revealed by barium meal in November, 1955.

On examination she was very pale, thin, lethargic, and dehydrated, with slight icterus. Her nails were normal. Blood-pressure 110/60 mm. Hg. Her tongue was smooth at the edges, but not sore. Her abdomen was slightly distended and intestinal peristalsis was visible, but it was not tender and no masses could be felt. The liver and spleen were not enlarged.

On investigation a severe macrocytic anæmia was found (see table for details of blood-counts). Free acid was present in the fasting gastric juice. No pus or blood was found in the fæces, and no pathogenic organisms were isolated. Liver-function tests were normal except for a serum-bilirubin level of 1·2 mg. per 100 ml. Bone-marrow examination revealed megaloblastic hæmopoiesis.

Treatment and Progress.—Her condition was such that treatment had to be started before the results of further investigations were available. She was given a transfusion of four pints of blood and an injection of vitamin B_{12} 1 mg. In addition treatment with folic acid 5 mg. q.i.d. by mouth was begun and continued throughout her stay in hospital. There was a dramatic improvement in her physical condition, in the blood picture (see table), and in her mentality.

As soon as she was fit enough for further investigation she was given a barium meal. This showed the hiatus hernia to be still present, but there was no other abnormality in the œsophagus, stomach, or duodenum. However, multiple diverticula were seen in the jejunum and ileum (see figure). The mucosal pattern was abnormal, particularly in the lower ileum, which showed the so-called deficiency pattern. In retrospect the diverticula were seen in the films taken in November, 1954.

EFFECT OF TREATMENT ON BLOOD PICTURE

Date	Hb (g. per 100 ml.)	R.B.C. (million per c.mm.)	P.C.V. (%)	M.C.V. (c.μ)	M.C.H.C. (%)	White cells (per c.mm.)	Film appearances
On admission in November, 1955	6·0	1·5	17·5	116	34	850	Macrocytosis, anisocytosis + +, no reticulocytes, neutrophils 33%, lymphocytes 67%, platelets 101,000 per c.mm.
Nov. 9, 1955 ..	Transfusion of 4 pints of blood, injection of vitamin B_{12} 1000 μg. treatment with folic acid 5 mg. q.i.d. started						
Nov. 14, 1955 ..	11·0		33		33	4200	Reticulocytes 6%, neutrophils 40%, lymphocytes 27%, monocytes 32%
Nov. 21, 1955 ..	10·1	3·5	34·5	97	29	9300	Reticulocytes 2%, normal differential white-cell count, slight hypochromia
Treatment with ferrous gluconate gr. 5 t.d.s. started							
Dec. 29, 1955 ..	12·6	3·9	39	99	32	7000	Normal differential white-cell count
March 5, 1956 ..	13·9	4·8	44	91	32		

A four-day fat-balance showed that, of a daily intake of 82 g. of fat, 10·5 g. (13%) was excreted. Vitamin-B_{12} absorption was studied by Dr. C. C. Booth, using a preparation labelled with radioactive cobalt. The absorption was initially slight and was not improved by giving the vitamin with intrinsic factor (as it is in addisonian pernicious anæmia). After a four-day course of aureomycin (chlortetracycline) 250 mg. six-hourly, however, absorption increased to normal.

During the initial period of observation the bowels were opened on an average 3 or 4 times daily. Initially the motions were watery, but after the administration of a light diet containing little fat they became semi-formed. When the special diet for the fat-balance was given, the frequency increased to 7 a day. During the four-day course of aureomycin it decreased to 1 or 2 a day, and the patient complained of constipation. Just before discharge a seven-day course of aureomycin was given, the bowels being opened once daily during this time.

Follow-up.—After her discharge the folic acid, which she had had regularly while in hospital, was stopped. She continued to have injections of vitamin B_{12} 1 mg. at monthly intervals, together with symptomatic treatment for her gastro-intestinal symptoms. Ten weeks later (March 5, 1956) the blood picture was normal (see table). She was well and leading a normal life. She was still having occasional abdominal pain and flatulence and passing one or two formed stools daily. In May, 1956, the vitamin-B_{12} injections were stopped.

Discussion

Patients with jejunal diverticulosis often present with colicky abdominal pain, vomiting, and a distended abdomen; and Dick's (1955) patient, like the one reported here, also had visible peristalsis. These findings suggest subacute intestinal obstruction, which diagnosis may appear to be supported by the finding of multiple fluid levels on barium-meal examination (Badenoch et al. 1955). It is important to recognise that these levels are due to stasis in the diverticula and do not represent obstruction in the lumen of the small intestine. On the other hand, the diverticula may not fill with barium (Taylor 1930), and then a radiological diagnosis is impossible.

The defect of fat-absorption is not great. In the present case 87% of the intake was absorbed; in the other published cases 82–88% was absorbed. This degree of malabsorption can only be detected by careful fat-balance studies. The motions are often watery and do not suggest steatorrhœa. It may well be that in some other published cases of diverticulosis and megaloblastic anæmia—e.g., Krevans et al. (1954) and Taylor (1930)—a defect of fat-absorption was also present but was not detected by examination of single specimens of fæces.

Dick (1955) noted cessation of diarrhœa after a course of aureomycin in his patient, and this, of course, is quite the reverse of the effect on normal people. He suggested that there may also have been remission of the anæmia, but the evidence was inconclusive.* In the present case the absorption of vitamin B_{12} became normal after the administration of aureomycin. A similar observation was made by Badenoch et al. (1955) in two of their four cases and by Krevans et al. (1954) and Halsted et al. (1956) in patients who had diverticulosis and megaloblastic anæmia without proved steatorrhœa. It will be of interest to see whether the anæmia can be kept permanently in remission merely by controlling intestinal function by intermittent courses of "broad-spectrum" antibiotics, without the need for parenteral administration of vitamin B_{12}.

Badenoch et al. (1955) discuss the reasons for believing that the association of jejunal diverticulosis, steatorrhœa, and megaloblastic anæmia is not fortuitous. They suggest that stagnation and bacterial growth occur in the diverticula, and that, when these are sufficiently numerous, the combined effect is equivalent to a "blind-loop" of intestine, causing steatorrhœa, with consequent impairment of vitamin-B_{12} absorption and, hence, megaloblastic anæmia. Though this explanation is probably correct in its essentials, one may question the importance of the steatorrhœa in these cases, since it is apparently never more than slight. An alternative explanation is that the abnormal bacterial flora of the intestine destroys, or competes for, the antimegaloblastic substances (Davis and Brown 1953, Girdwood 1956).

The beneficial effects of broad-spectrum antibiotics suggest that infection plays an important part in the pathogenesis of the anæmia. That they do not act merely by controlling the diarrhœa was shown by Halsted et al. (1956), who found (in a similar case) that administration of a sulphonamide—sulphafurazole ('Gantrisin')—stopped the diarrhœa but did not improve the vitamin-B_{12} absorption. It would have been of great interest to observe, in the present patient, whether fat-absorption did in fact improve pari passu with absorption of the vitamin, but unfortunately it was impossible to make this observation.

* Since this was written a case has been published (Blachford and Dawson 1956) in which a definite hæmopoietic response was obtained after the administration of aureomycin and before the exhibition of any hæmatinic.

Summary

A woman, aged 60, with multiple diverticula of the small intestine, developed steatorrhœa and megaloblastic anæmia. Vitamin-B_{12} absorption was impaired but became normal after a course of aureomycin.

I wish to thank Dr. F. H. Scadding for permission to report this case; Dr. C. C. Booth and Dr. D. L. Mollin, of the Post-graduate Medical School, for studying the vitamin-B_{12} absorption; Dr. J. W. Stewart for help with the investigations and in the preparation of this paper; and Sister M. Hammond and her staff for their coöperation in carrying out balance-studies for several weeks.

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SEVERE CHOREA GRAVIDARUM TREATED WITH CORTICOTROPHIN

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CHOREA gravidarum, which is generally considered to be a rheumatic manifestation identical with Sydenham's chorea, is a rare complication of pregnancy, with a reported incidence of from 1 : 2200 to 1 : 3500 (Willson and Preece 1932). Although plenty of cases of chorea gravidarum have been published, we found only one report of its treatment with cortisone (Schwarz and de Saint-Victor 1952) and none with corticotrophin.

Case-report

A married primigravida, aged 25, had had no previous rheumatic manifestations. On Aug. 24, 1955, she noted restlessness followed by twitching of her left arm. During the next two days these movements spread to her other limbs. On Aug. 27, the fourth day of her illness, she developed abdominal pain and was admitted to hospital.

On examination she was well nourished but showed generalised choreiform movements and grimacing; her

temperature was 99°F, and pulse-rate 90. Her uterus was just palpable through her abdomen, and she had some tenderness in her right iliac fossa. There were no signs of involvement of the cardiovascular system or of arthritis. Her erythrocyte-sedimentation rate was 40 mm. in the first hour (Westergren).

Progress.—During the thirty-six hours after admission the chorea became more severe and she became maniacal, threshing continuously about in a padded cot, incontinent, screaming intermittently, quite out of touch with her surroundings, and unable to swallow. This deterioration had taken place in spite of heavy sedation with phenobarbitone, paraldehyde, and carbromal together with salicylates and nursing in a single darkened room. In view of her inability to swallow she was fed by intravenous drip and sedation was increased, hyoscine and 'Omnopon' being the most effective drugs. However, it was only a dosage that depressed respiration to a dangerous degree that adequately controlled the movements.

Corticotrophin Therapy.—On Aug. 30, the seventh day of her illness, the patient's condition had become so critical that it was thought that the pregnancy should be ended; but this was put off while treatment with corticotrophin 120 units daily was started, sedation being continued. Next day there was considerable improvement in spite of reduced sedation, and by Sept. 3, 1955, the patient was eating normally and intravenous fluids were discontinued. Corticotrophin dosage was now reduced to 80 units daily. Meanwhile the choreiform movements were diminishing in force and amplitude and finally disappeared on Oct. 7, 1955. By this time the dosage of corticotrophin had been reduced to 20 units daily, and corticotrophin therapy was discontinued on Oct. 21, 1955. There was no recurrence of the choreiform movements, and the patient was discharged from hospital on Nov. 7, 1955. The only complication of the treatment was a moderate degree of "moon-face."

Follow-up.—On April 3, 1956, the patient was delivered of a healthy male child weighing 7 lb. 10 oz. Re-examination on June 5 revealed no evidence of involvement of the cardiovascular system, and there were no persisting signs in the nervous system. The baby was continuing to thrive.

Discussion

According to Willson and Preece (1932) there is a high maternal mortality, 33% of cases in which delivery was artificial and 18% of all cases. The fœtal mortality was 50%; but, if cases terminating before viability were excluded, the mortality was only 20%. Beresford and Graham (1950) disagree with these figures and report a maternal mortality as low as 1·4% with a fœtal mortality of 3·3%. It seems that either the condition has become less severe over the intervening years or that treatment has improved. Pregnancy was terminated artificially in 18·9% of the earlier series but in less than 5% of the later series. These figures may merely indicate that the severity of the condition has diminished over the years, but they also suggest that there is an increased maternal mortality when pregnancy is artificially terminated. It therefore seems advisable to avoid this procedure whenever possible in the presence of chorea.

Is there reason to believe that either corticotrophin or cortisone can further decrease the mortality-rate? These drugs are known to be of value in the treatment of rheumatic fever. The results in Sydenham's chorea are not very satisfactory (Dixon and Bywaters 1952), and there is no real reason to think that they would be more effective in chorea gravidarum. However, chorea in pregnancy is much more severe than the chorea of childhood; consequently improvement may be more dramatic and more easily assessed. In the case reported by Schwarz and de Saint-Victor (1952) improvement began between twenty-four and forty-eight hours after the start of cortisone therapy, and the choreiform movements had ceased five days after treatment had begun. The severity of their case seems very similar to that of the present case with improvement occurring at about the same time. We feel that the dramatic improvement in the present case was probably attributable to the corticotrophin, but a spontaneous remission cannot be excluded. Nevertheless this method of treatment seems to deserve further trial, particularly in the severe progressive cases in which the pregnancy might otherwise have to be terminated. The evidence whether these drugs may prevent permanent cardiac involvement is inconclusive. In the case of Schwarz and de Saint-Victor (1952) it seems probable that permanent damage occurred. In our case there is no evidence of such involvement, but admittedly it is too early to rule out this possibility. In neither case was any ill effect of either corticotrophin or cortisone noted on the fœtus.

Summary

A severe case of chorea gravidarum was treated with corticotrophin.

The successful outcome was probably due to the corticotrophin.

Corticotrophin therapy is worthy of further trial, particularly when termination of pregnancy may be the alternative.

Our thanks are due to Dr. T. A. Kemp and Mr. J. P. Erskine for their advice and permission to publish.

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Reviews of Books

Pott's Paraplegia

D. LL. GRIFFITHS, F.R.C.S., Manchester; H. J. SEDDON, D.M., F.R.C.S., London; R. ROAF, M.CH. ORTH., F.R.C.S., Liverpool. London: Oxford University Press. 1956. Pp. 129. 50*s*.

No comparable work on this subject has appeared since the classical papers by Butler and Seddon in 1935. Here is an enemy with which surgeons have been in intimate and largely impotent contact for many decades. Only recently have methods of attack been developed which are commonly successful. This book crystallises what the authors have been teaching for several years past: here they give us the fruit of their combined experience, which far exceeds that of any individual in this country.

They have shown that in all but exceptional cases it is compression alone that matters; they are impressed by the high proportion of cases in which this compression was due to solid matter, and it was natural that their thoughts and efforts should be directed towards the best means of removing the compressing element. They review in detail the clinical features and pathology of Pott's paraplegia, the indications for operation, and the results of the various procedures that have been tried. They do not decry conservative treatment but lay down tentative rules for when such treatment should be abandoned. Operatively their work is a development of the lead given by Capener, Dott, and Alexander. They are concerned to place the procedure of anterolateral decompression in perspective. This is a serious operation which should be confined to the hands of experienced spinal surgeons; but the results warrant the risks. While there remain indications for costotransversectomy, and occasionally for laminectomy, it is evident that only anterolateral decompression can possibly relieve many of the patients, and this book gives expert guidance on whether, when, and how to do it. As an aid to that most difficult art—surgical judgment—it could scarcely be bettered.

For a short book this is highly priced, but it is well worth the money.

Radiology of the Alimentary Tract in Infancy

ROY ASTLEY, M.B., D.M.R., radiologist, Children's Hospital, Birmingham; clinical lecturer in radiology, University of Birmingham. London: Edward Arnold. 1956. Pp. 287. 50*s*.

IN recent years the value of radiological examination of the alimentary tract in infancy has been fully appreciated, owing largely to the work of Dr. Astley, who in this admirable book fills a gap in the radiological

literature of this country. The work is based on his extensive personal experience, and the value of, and indications for, the various procedures are clearly defined and authoritatively explained; in addition, there are many useful practical tips for radiologists. The illustrative case-histories at the end of the chapters enhance the value of the book, a notable feature of which is correlation of radiological findings with clinical conditions. This book is written primarily for the radiologist, but it will prove of equal value to pædiatricians and pædiatric surgeons.

L'hémisphérectomie

E. LAINE, professeur à la faculté de Lille; CL. GROS, professeur agrégé de neuro-chirurgie. Paris: Masson. 1956. Pp. 134. Fr. 1000.

THIS short monograph presents the joint experience of the two authors in 39 cases of hemispherectomy: 30 were done in cases of infantile hemiplegia, 7 for extensive hemisphere neoplasms, 1 for a widespread angioma, and 1 in a case of spontaneous carotid thrombosis. In 1 case of tumour where the patient died three months after operation detailed histological studies of the tract and nuclear degenerations elsewhere in the central nervous system are described.

The clinical effects of the removal are evaluated and the surprisingly slight losses in motor and sensory function (previously noted by others) are once more emphasised. Though fine movements and discriminative sensation are permanently affected after operation, even if they were not already reduced preoperatively, in some cases lessened spasticity actually improves motor performance. The operations varied, and both removal and preservation of the caudate nucleus were practised. The only constant difference in results appeared to be a more pronounced and persistent postoperative hyperreflexia with the latter operation.

The main indications for operation in the infantile hemiplegias were evidence of hemisphere damage associated with epilepsy and behavioural abnormality. In such cases there was always some improvement in behaviour and social adaptation. There was no convincing improvement in intellectual level, but, in some, language function improved and many appeared able to make better use of their intellects. In 17 of 23 cases followed for two to five years, epilepsy was abolished or greatly improved. The electro-encephalographic records also showed great improvement.

The authors carefully consider indications and contra-indications for the operation and discuss the adjuvant tests needed to reach a decision.

This is a useful report on an operation that is still not widely practised—although one or two neurosurgeons in this country can probably assemble a larger series of cases. The picture presented is very similar to that in Krynauw's original publication in 1950, in which he first proposed this operation for infantile hemiplegia and reported 12 cases. The general impression is that removal of abnormal tissue with its concomitant abnormal electrical activity allows the remaining parts of the cerebrum to function more efficiently.

The Ætiology of Irregularity and Malocclusion of the Teeth

2nd ed. JAMES COUPER BRASH, M.C., M.D., D.SC., emeritus professor of anatomy, University of Edinburgh; H. T. A. MCKEAG, F.D.S. R.C.S., D.ORTH. R.C.S., reader in orthodontics, Queen's University, Belfast; J. H. SCOTT, M.D., L.D.S., lecturer in anatomy for dental students, Queen's University. London: Dental Board of the United Kingdom. 1956. Pp. 503. £2 2*s*.

THE first edition of this book consisted of four lectures given by Professor Brash for the Dental Board in 1929; this new edition has been expanded by what is described as an "annotated bibliography" (in fact, a most comprehensive review) of more recent work on the development of the skull and face, compiled by Mr. McKeag and Dr. Scott. An appendix, which appeared also in the first edition, deals with the possibility of determining by statistical methods a standard of "rightness" for the dentition. The orthodontic specialist will find here not only much of assistance in treatment planning, but also many suggestions for possible lines of research.

As Professor Brash is careful to point out, orthodontic treatment must never be allowed to become mechanical and governed by systems of classification; malocclusions which appear to be similar may have totally different origins, and to treat them alike may lead to failure. He stresses the value of a good knowledge of normal development, in order that conditions which are temporary and self-correcting may be recognised. A particularly valuable chapter deals with the order of tooth eruption and the eruptive patterns which dispose to malocclusion. Even though this order is beyond the orthodontist's control, it can at least warn him of future difficulties.

Professor Brash's main conclusion is that the problems of malocclusion are essentially those of growth and development in general, and that dental irregularities are more likely to be inherited than produced by environmental influence in its widest sense. But, because of the great development in genetics since 1929, the picture now seems less clear-cut than it did twenty-five years ago. Apparently other modifying factors, such as physical stress and acquired abnormal muscle patterns, must be taken into account.

Problems of Adolescents (London: Pitman Medical Publishing Co. 1956. Pp. 174. 20*s*.).—In this book Dr. H. Edelston describes "an experiment in sex education with adolescents," consisting essentially in delivering a lecture, of which he gives the approximate text, to a group of mixed adolescents, inviting written questions—to be signed "M" or "F"—and proceeding to further sessions based on the questions. He has now followed this procedure a number of times at the invitation of youth groups, usually Jewish, and he records the questions commonly asked and the kind of answers he gives. Not all would follow him precisely, but anyone likely to have to answer or to instruct the teen-ager on sexual problems will find the book instructive and helpful.

Diseases of the Heart and Circulation (2nd ed. London: Eyre & Spottiswoode. 1956. Pp. 1005. 5 guineas).—For the second edition Dr. Paul Wood's comprehensive treatise has been considerably expanded; and there is a new chapter on pulmonary hypertension, which sets out clearly the author's important views on the subject. Whenever possible, statements are backed by personal experience, and the physiological basis of physical signs and diagnosis is clearly illustrated by the results of special investigations. The bibliography is comprehensive and helpful, and the illustrations copious and excellent. Written authoritatively by an expert who has himself made outstanding contributions, this work cannot fail to be of value to those interested in cardiology.

Dental Health (London: Dental Board of the United Kingdom. 1956. Pp. 83. 10*s*. 6*d*.).—This little book, a complete revision of a handbook on oral hygiene which the Dental Board published twenty-nine years ago, is primarily intended for school-teachers. The text, edited by Prof. H. H. Stones, is brief, clear, and well illustrated by photographs, diagrams, and photomicrographs. 34,000 copies of the first edition were sold; this one should have at least an equal success. It earns a place in most dental waiting-rooms, where it may help to discredit a few old wives' tales and to elucidate the mysteries of that odd, amorphous, and seemingly ubiquitous organ which is always being touched—namely, the "nerve."

Clinical Laboratory Methods and Diagnosis (5th ed. London: Henry Kimpton. 1956. Pp. 2451 [2 vols.]. £14).—The latest edition of this valuable work, by Dr. R. B. H. Gradwohl, is published in two large volumes. The book has been extensively and capably revised and extended; a chapter on medical mycology, by C. W. Emmons, is a notable addition. It is a pity that the colour illustrations are not better. Although the methods described are American, this book should be in the library of every routine laboratory.

Postural Drainage (London: Lloyd-Luke. 1956. Pp. 56. 8*s*. 6*d*.).—The vital importance of postural drainage in the management of various respiratory disorders is increasingly recognised, but visitors to large thoracic centres still often find that the results obtained there are much better than those they achieve in their own practice. This superior measure of success is founded on careful attention to details of technique that are clearly described in this excellent little book, which will be useful to those concerned with the treatment of respiratory disease.

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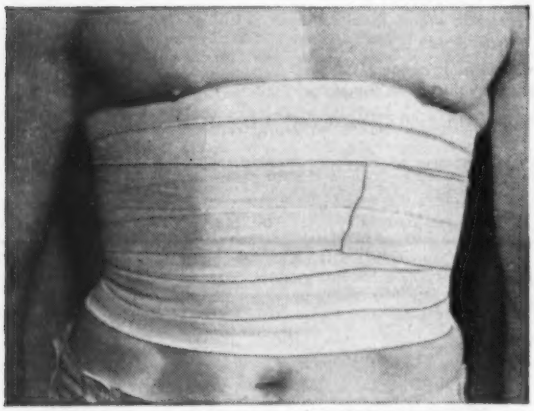

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LONDON: SATURDAY, OCT. 27, 1956

Klinefelter's Syndrome

LIKE the pancreas, the testis consists of two admixed but largely independent glands, one exocrine, making up the bulk of the organ, the other endocrine, scattered in small islets. The exocrine gland consists of the testicular tubules, which secrete spermatozoa, the endocrine gland of the interstitial cells, which secrete androgens. They are not quite independent, for, though the interstitial cells can function without the tubules, the tubules cannot function without androgens; but for many purposes they can be regarded as separate. In their relations with the pituitary they run, at least in the broad outlines that are all we know with any certainty so far, in parallel but quite separate lines. The tubules are stimulated to activity by follicle-stimulating hormone (F.S.H.), and, after the self-compensating mode of so many pituitary axes, a so-far undemonstrated but highly probable hormone of the active tubules inhibits pituitary over-secretion of F.S.H. Similarly with the interstitial cells: luteotropic hormone stimulates them, and the negative feed-back is supplied by the androgens which inhibit secretion of luteotropic hormone (this hormone and interstitial-cell-stimulating hormone being regarded as one).

The distinction of Klinefelter's syndrome in the first place amounted to little more than the recognition that these two elements of the testis could be functionally separated in one form of testicular atrophy. The essential lesion is a pure tubular atrophy, sparing the interstitial cells: there is a consequent flogging-the-dead-horse rise of F.S.H. The original cases [1] had eunuchoidism and gynæcomastia, but it has been convincingly shown [2] that neither of these is an essential element. The eunuchoidism, inconstant and seldom extreme, probably reflects partial and perhaps episodic added interstitial-cell failure: the gynæcomastia, also inconstant or tending slightly to negative correlation with eunuchoidism, presumably reflects pituitary hyperactivity. In view of recent developments, it is important to recognise that the eunuchoidism contains no element of positive feminisation, being no more than that seen in castrates, and the breast development is no nearer the feminine type than is that in undoubted males subject to such various causes of gynæcomastia as malnutrition, hormone therapy, testicular tumours, or liver disease. The original description of Klinefelter's syndrome [1] and the first endocrinological study of Turner's syndrome [3] both came from FULLER ALBRIGHT'S department and were published nearly simultaneously. This is not pure accident, for both publications depended chiefly on the demonstration of an inactive gonad and the related rise in urinary F.S.H.; but it adds further point to the way in which recent developments have coupled them together.[4] Where Turner's syndrome had always sufficient elements of the bizarre to lead to strong suspicion that its origin might be equally out of the ordinary, Klinefelter's syndrome seemed to be little more than a convenient pigeon-hole into which to put one fairly obvious form of testicular atrophy. Dissociated atrophy of the same kind is common in undescended testes and is the usual consequence of sterilising doses of irradiation. Given that such a lesion can arise sometimes without cause, the rest of the syndrome follows automatically: there is nothing unexpected about it except its causelessness.

The two papers on the subject which we publish this week deal in more detail with the remarkable finding reported briefly by several workers independently.[5–8] Skin biopsies, oral mucosal scrapings, the very Leydig cells themselves, show the chromatin bodies in the nuclei which, as far as we can tell, always indicate the presence of the female XX chromosome pair. While the mirror-image finding in Turner's syndrome has been accepted quietly enough on the whole, because the syndrome was a curious one from the first and because some experimental backing for a plausible explanation of the anomaly could be found, there has been an undercurrent of incredulity among some of the Klinefelter reports. It is hard to stomach the fact that these patients, who seem to miss by so little being perfectly normal fertile men, can be genetically female. BUNGE and BRADBURY,[9] for instance, having found germinal cells in mitosis in a few tubules in their cases,[8] doubt very much whether this is compatible with the idea of their being in any sense female. Partly this is a purely verbal difficulty. The statistician's ideal penny, which always falls heads or tails, is mocked by the occasional throw which sticks in the floorboards and stands on edge. We find it necessary to assume that all human beings must be either male or female. Up to now, except in a very few true hermophrodites, serious incompatibility between the genetic sex indicated by the sex chromatin and the histological type of the gonad has not been found. But it is not inconceivable. When the penny stands on edge it appears to be heads from one side and tails from the other, and we may have to accept the occurrence of individuals whose sex depends, even more fundamentally than in the relatively superficial cases of pseudohermaphroditism, on the way one looks at it. BUNGE and BRADBURY'S cases may be female only in the sense in which a female carrier of hæmophilia is a hæmophiliac. JACKSON et al.'s case was a homosexual—what evidence could one give as to the nature of "his" sex in a court of law?

It may, however, be not so simple. In both of PLUNKETT and BARR'S cases the apparent sex of the blood-films was not so clearly female—one at least would ordinarily be regarded as male—as the epithelial-cell nuclei. There are rumours of a similar discrepancy in other cases, though it is certainly not present in all. This apparent sexual chimæra may be a pointer to an anomaly of the sex chromosomes. (What would one not give for a reliable method of chromosome counting in man!) There appear to be

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cases of this syndrome with skin and blood both male, cases with skin and blood female, and cases with skin female and blood male. Perhaps these all represent different fundamental lesions. A proper understanding of the pathogenesis of Klinefelter's syndrome, even more than Turner's, would carry us very far into the understanding of the factors, hereditary and hormonal, which control the growth and differentiation of the human embryo.

More Dysentery

IN discussing fluctuations in the incidence and deadliness of infectious diseases the epidemiologists have exhibited much learning and some ingenuity. But, because most of the classical instances belong to the era before PASTEUR, the arguments end indecisively. Rightly or wrongly, we are nowadays unwilling to define a disease unless we can identify the infectious agent associated with it. Influenza and poliomyelitis are examples of infectious disease whose pattern seems to have altered within recent years, but our understanding of both is still incomplete. In his presidential address last week to the section of epidemiology of the Royal Society of Medicine Dr. IAN TAYLOR pointed to quite startling changes in the natural history of Sonne dysentery—an apparently "simple" disease due to a bacillus which may be identified in any laboratory. First noticed in England in 1924, it showed its presence only sporadically until 1937. Since then it has been always with us, first in a wave which reached its height in 1944–45, and then, after relapsing for a few years to the rates seen just before the war, in an even higher wave which began in 1949 and whose crest may not yet be in sight. So far as may be judged from the available figures, the maximum incidence has always been in March; but until 1947 there was a second peak in September–October which has since disappeared. Now, autumn is the season not only of mists and mellow fruitfulness but also of food-poisoning and the enteric infections; and this may have some bearing on the fact that, while the total number of infections with *Shigella sonnei* has risen rapidly, the food-poisoning incidents from this cause have become fewer and fewer. (During the war years, about half the reported outbreaks seem to have been due to infected food or drink.) Until 1947 Sonne dysentery, like other enteric diseases, was always commoner in the country than in the town, but at that point the differential was reversed: indeed the recent astronomical increase has been almost limited to the urban population. Another change which seems to have begun about the same time is in the age-incidence. Sonne dysentery has always been a disease of children, but of late years the proportion of cases in the age-group 5–14 has risen at the expense of the group 0–5. The conclusion that it is now largely a disease of the primary-school age gets support from a detailed survey of the weekly incidence. The wave of infections in March usually has two crests with an interval of two weeks; and, though a movable feast presents unusual problems to the statistician, a reasonable guess is that this gap is caused by the Easter holiday. In general it is true that the disease is more prevalent in the north and east of England than in the south and west, but this may be no more than a result of its modern preference for towns. In 1950 the weekly notifications suggested that an epidemic wave began in north-eastern England and travelled southward. Most of the large towns have suffered a major outbreak, but this experience is seldom repeated annually. Some towns have so far escaped, but their turn may come. In London the highest incidence is seen in a solid block of overcrowded boroughs, and a survey in 1953 confirmed the association of individual infections with crowded homes.

This is imaginative epidemiology at its best. Studious application to facts and figures has produced the data: a lively mind has shaped them into an original and persuasive thesis. If Dr. TAYLOR is right, Sonne dysentery is no longer an "enteric disease," like the other bacillary dysenteries, but a disease spread by contact, like measles: his findings, he suggested, are "consistent with the idea that, whereas the disease was at one time spread by a combination of food-borne infection and personal contact, it has now abandoned its attempt to be a food-borne infection, and has adopted the far more successful method of personal contact." To explain this change is, of course, another matter. The *Shig. sonnei* found today may not be identical with the strains isolated in 1939 though they cannot be distinguished by the ordinary methods of bacteriology. Typing with bacteriophage has proved a disappointment with this species, but re-examination of such pre-war strains as survive might be worth undertaking. At the time, the 1939–45 epidemic was put down to the movements and inconveniences of war; but this will not do for the larger one which began in 1948. In the years immediately after the war our population was swollen with transients from all corners of the world, who might have brought a fresh and more successful strain of *Shig. sonnei* to our shores. It would be interesting to know whether the same change of habit has been seen in other countries. All in all, our children will probably hold it against us that we did not make more accurate and intelligent observations in the fatal year 1947.

On the prevention of Sonne dysentery, Dr. TAYLOR, though he does not sink to the prophylactic nihilism of Harry Hawke,[1] is not optimistic. The symptomless excreter, he thinks, has probably been feared unduly. From almost every point of view, admission to hospital is undesirable, as Dr. EASTON's figures show.[2] Perhaps a suitable prophylactic drug may be found; and meanwhile Dr. IRENE HUTCHINSON's observations[3] suggest again that much more attention should be paid to the design and installation of water-closets, especially in schools. There is also another approach to the problem which deserves thought. Just as the figures seem to show that, in any particular town, Sonne dysentery seldom becomes epidemic in successive years, so there is scattered evidence that the patient who has recovered enjoys some immunity from infection. The reason why attempts to induce active immunity have not been pursued with more vigour may be chiefly that the disease is more of a nuisance to the epidemiologist than to the patient, his parents, and his doctor.

1. The Merrygowhimbles. (Widdicombe File) *Lancet*, 1955, i, 1216.
2. Easton, H. G. *Ibid*, 1955, ii, 241.
3. Hutchinson, R. I. *Mon. Bull. Minist. Hlth Lab. Serv.* 1956, 15, 110.

Surgical Stocks

THE story told by Mr. CATER and Mr. HICKS on p. 871 has an old moral: we are very much at the mercy of those who make the things we use in medical and surgical practice. In 1950, at the Birmingham Accident Hospital, corrosion was observed in metal used for plating fractures; and in the next three years corrosion was a complication in at least 43% of fractures thus treated. Corrosion was limited to one kind of screw—the fine-thread Sherman type. WRIGHT and AXON [1] have lately discussed the electrolytic corrosion of stainless steel in bones, and they emphasise again the importance of using plates and screws of identical metals in exactly the same metallurgical condition. The suppliers of the Sherman screws used at Birmingham were asked about the composition of the screws, and their reassurances included statements that they had been "passivated" and "electrolytically polished." Such vague terms may have spurred Mr. CATER and Mr. HICKS to further efforts; for, although their attention was deflected for a time to the possibility of sepsis as a cause of the trouble, they eventually decided that the metal in the screws should be analysed. It was then found, four years after the first suspicion had been aroused and lulled, that the screws were in fact being made from a type of stainless steel which has been known to cause corrosion when placed in living tissues. Almost 7000 screws made from the offending steel were sold during the four years. In the same period complaints of corrosion associated with screws of this type came from places as far apart as Borneo and Canada; and research was undertaken in Cambridge, in part to elucidate the cause of tissue reaction around so-called non-toxic stainless steel—a reaction which seemed to vary from case to case. To make matters worse, it now seems that long-standing electrolytic corrosion may lead to malignant change in bone.[2]

Where does the responsibility for this dangerous confusion lie? At the manufacturers' end there were long lines of communication and liaison was poor. About 1950 the suppliers received complaints that the thread of their screws, which were manufactured by another firm from an appropriate non-corrosive alloy, had lost clarity. The manufacturers, for whom surgical screw-making was presumably a side-line to the bigger business of making screws for general use, met the complaint by changing to a different form of steel. It seems that they had not been told how metals behaved in the body; and they no doubt thought that any stainless steel would do. The alteration should, of course, have been made known, but there was no reason for the manufacturers to appreciate the extreme importance of doing so. Lack of contact between manufacturers and suppliers thus led to a situation in which the customer's suspicions were fobbed off by the middleman apparently in good faith—though it is hard to understand why the suppliers did not make more diligent inquiries of the manufacturers at this stage. One way to prevent this and similar disasters would be to adopt the pharmaceutical practice and state on the container the materials used in the manufacture of any substance which has to be placed on or in the body. How often, for example, do we know whether a prosthesis contains materials to which a patient may become sensitive? It might be argued that a doctor cannot be a metallurgist or a chemist and that the information would be of little value. But specialists should, in fact, be familiar with the properties of the substances they use and if the contents are named in detail on the container, there is less chance of a medically unauthorised change passing undetected. Indeed, it is proper to consider anything we place upon or within the body as a drug, no less than substances given by mouth or by injection, since they may all contain pharmacologically active ingredients.

The investigation by Mr. CATER and Mr. HICKS raises a further issue of responsibility. They inspected theatre stocks held in readiness for plating operations in other hospitals and found "an amazing collection"—even plates of ordinary steel and soft-iron screws designed for use in wood. How many of our smaller hospitals where plating and screwing are rarely performed still hold such stocks, simply because it is nobody's job to make a regular review of the materials which may be used? Surgeons must take responsibility for this, but how often do they make a formal inspection of the stocks? The task is left to the theatre sister who cannot be expected to know whether or not a certain material has now been proved harmful. If the theatre stocks were inspected as a routine once a year, or even more often, by a surgeon, this extra duty would be more than justified by the greater safety for patients and, it must be admitted, by the added safeguard against litigation; for, though it would be a nice legal point to say who was responsible for disability caused by a Sherman screw made of unspecified material, the surgeon who used a substance known to be injurious might have difficulty in defending himself.

1. Wright, J. K., Axon, H. J. *J. Bone Jt Surg.* 1956, **38B**, 745.
2. McDougall, A. *Ibid*, p. 709.

Annotations

HAZARDS OF THE SEA

IN war-time the seas have proved for Britain a tenuous and costly lifeline. Prof. R. A. McCANCE, F.R.S., and others have now written a remarkable account of the hazards to which men in ships lost at sea between 1940 and 1944 were exposed.[1] Their study is based on interviews with, or depositions by, survivors of 448 ships, and covers 27,000 individuals.

The sinkings took place in all latitudes, with the greatest concentration on the Atlantic convoy route. The mortality in the whole series was 32%. As the authors point out, although this figure is lower than might have been imagined it affords no grounds for complacency. Many of the survivors had severe cold injuries; most of these ships were in convoy; and a retrospective study in which only the survivors can give evidence must tend to underestimate the death-rate. The 32% mortality is made up of 26% on the ship or in the water (probably most often in the water) and of only 6% after life-craft had been reached. Furthermore, most of the voyages in life-craft were short. Both these findings confirm the Medical Research Council's [2] war-time advice to ship-

1. The Hazards to Men in Ships Lost at Sea, 1940–44. By R. A. McCANCE, C. C. UNGLEY, J. W. L. CROSFILL, and E. M. WIDDOWSON. *Spec. Rep. Ser. med. Res. Coun., Lond.* 1956, no. 291.
2. Medical Research Council war memorandum no 8. H.M. Stationery Office, 1943.

wrecked men. They emphasise the need for ensuring that life-craft are launched, and that men succeed in boarding them. McCance et al. analysed the effects of many factors influencing the chance of survival in life-craft. The most important was the temperature. On seas below 5°C the mortality in life-craft was 25%; the low mortality in life-craft in the whole series was partly due to the fact that only a small proportion of the sinkings were in very cold waters. In cold regions the mortality was 20% in lifeboats compared with 40% on rafts. Evidently the degree of protection afforded by the life-craft is very relevant, and there is ample justification for the work that has gone into developing the modern tented life-raft.[3]

Water-supplies in life-craft were almost as important as the temperature. The death-rate varied from 33% where no water was available to 2% where there was a plentiful supply. A supply of 4–8 oz. per man per day seems to be the least for avoiding a high death-rate from dehydration. One of the most striking features was the disastrous effect of drinking sea-water. In 163 craft for which data were available, 39% of the occupants died in craft where sea-water is known to have been drunk, compared with 3% in craft where there was no report of sea-water drinking—a difference which, it was found, was not due to differences between the two groups in the duration of the voyage, the environmental temperature, or the amount of fresh water. This grim warning should become widely known. As McCance et al. show, provision of enough fresh water in life-craft will remove most of the temptation to drink sea-water.

OBSTETRICS UNDER DIFFICULTIES

THOSE of us who feel tired and fractious after a busy outpatient session or a long surgery should read about antenatal clinics in Ibadan, Nigeria, at which up to 500 patients attend each session. Dr. J. B. Lawson and Dr. Una Lister have compiled a clinical report of the work of the department of obstetrics of University College, Ibadan, in the period from April 1, 1953, to Dec. 31, 1954. The new University College Hospital should be completed next year and will provide 110 beds for obstetrics and gynæcology. Meanwhile 45 obstetrical beds in the Adeoyo Hospital have had to serve as the principal maternity unit for a population of about 750,000. In these beds 5582 patients were delivered in the twenty-one months covered by the report. At the start of the period the medical staff of the unit consisted of the two consultants and a junior house-surgeon holding a local qualification.

Record-keeping in Ibadan is difficult because only a small minority of patients know their age or the date of their last menstrual period. In telling their histories, patients and interpreters give the answers which they think would be the most acceptable, and it is usual to suppress unhappy incidents such as stillbirths. If a previous pregnancy has resulted in a stillbirth, a patient may not only conceal this information but give a different name in the hope of changing her luck. In such circumstances the obstetricians might well have despaired of producing a clinical report. Not so Dr. Lawson and Dr. Lister, whose account is of great value.

In the twenty-one months there were 76 maternal deaths (13 per 1000 total births). The stillbirth and neonatal-death rates were 70·4 and 61·8 per 1000 total births. For emergency cases the maternal mortality was 49·6 per 1000 and the stillbirth-rate 207 per 1000. Anæmia is perhaps the biggest individual problem. Because hospital beds were so few, anæmic patients could be admitted only if their hæmoglobin level was less than 50%; there were 182 such cases. There were 35 cases of ruptured uterus with 14 deaths, and 175 cases of obstructed labour with 23 deaths. The incidence of toxæmia of pregnancy was low, and rheumatic cardiac disease and pulmonary embolism were not observed.

It is gratifying to know that the superintendent midwife received recognition from the people of Ibadan in that she was installed by the Olubadan as chief *Iya Abiye* (mother of all living children). For the whole staff the chief sources of encouragement have been the erection of the new building and the growing confidence of the people, which is leading them to seek advice earlier in their pregnancies.

3. See *Lancet*, Oct. 13, 1956, p. 770.

LABORATORY INFECTIONS

IT used to be said that the late Sir John Ledingham was the only bacteriologist in England who had worked with *Pasteurella tularensis* and escaped infection. There are few bacteria with a reputation so evil and most of these are rarely met with in this country. It has long been known that all species of brucella and rickettsia should be handled carefully.[1,2] Enteric fever is commoner among bacteriologists than it should be. Some recent evidence suggests that those who work in hospital laboratories may acquire tuberculosis rather commonly compared with those in other jobs.[3] Bacteriology has had its martyrs, but the death of many of these was due to one disease—yellow fever—and the bacteriologist would have to admit that some of his infections have been due to carelessness and nothing more. Accidental infections in the laboratory have now become the subject of renewed interest. Some of this arises from catastrophes whose history is well known, and some from more speculative reasoning based on new observations on the distribution of bacteria.

The airborne dispersal of bacteria has been assumed for many years, but such exact knowledge as we have of it is comparatively recent. Not only may the viable bacteria in aerial suspension be identified and counted, but it is possible on occasion to show that these may initiate both local and systemic infections. The route of infection for the latter has generally been assumed to be through the lungs—and the history of anthrax confirms this—but experimentally it has been shown that infections with brucella and salmonella may occur by way of the eyes. The methods used for studying the bacterial content of the air in operating-theatres have been applied to the bacteriological laboratory and the findings have caused some alarm.[4–6] Removing the rubber bung from a tube containing a fluid culture; blowing the last few drops from a pasteur pipette; even spreading a culture on a petri dish—each of these simple manœuvres disperses a certain number of bacteria. Centrifuging a culture is safe enough—until the tube breaks—and, not surprisingly, a homogeniser will release a substantial bacterial cloud if the fit of its parts is imperfect. One of the most nephelogenic operations is the post-mortem examination of an infected animal, and there is reason to fear that the same may be true of human necropsy. All these are only examples of everyday procedures which have been shown to produce bacterial aerosols; there may be others.

Some infections acquired in the laboratory are almost certainly due to airborne bacteria, but the quantitative aspects of this peril are obscure. If the risk were a grave one, the bacteriologist should stand between the merchant seaman and the bartender in the tables of morbidity. He seems, in fact, to have much the same health as his colleagues in other departments. Yet it would be foolish to be too complacent. Few have noticed how bacteriological technique has altered within living

1. Sulkin, S. E., Pike, R. M. *Amer. J. publ. Hlth*, 1951, **41**, 769.
2. Smadel, J. E. *Ibid*, p. 788.
3. Long, E. F. *Ibid*, p. 782.
4. Anderson, R. E., Stein, L., Moss, M. L., Gross, N. H. *J. Bact.* 1952, **64**, 473.
5. Wedum, A. G. *Amer. J. publ. Hlth*, 1953, **43**, 1428.
6. Reitman, M., Wedum, A. G. *Publ. Hlth Rep., Wash.* 1956, **71**, 659.

memory. The change has been towards quantitative methods which involve far greater use of pipettes; to more extensive cultures on a larger number of petri dishes; to more use of the centrifuge; and to the cultivation of potentially dangerous organisms, such as tubercle bacilli, on a far larger scale. Where the methods of chemical engineering have been adapted to the manufacture of large quantities of bacterial cultures the risk would seem even greater. At the same time realisation of the dangers of bacterial aerosols has stimulated the development of protective devices. For those who work with viruses an inoculation cabinet in which all manipulation is carried out is a matter of course.[7,8] The infectious particles set free within it are killed by ultraviolet light or led into the outside air by suction. Such a cabinet may be used for animal inoculation and examination as well as for handling cultures. The cups of the centrifuge may be covered with metal caps so that the breakage of a tube can do no harm. Changes in the design and use of pipettes can reduce their potential danger.[9] All such precautions can lessen the risk, but so long as the bacteriologist wears the same white coat (with or without buttons) for work, for tea, and for an hour in the library he is falling below the standard which he preaches to the surgeons. There seems no end to the improvements which might be suggested in equipment and method, but, in the absence of a murrain among the bacteriologists, it will probably be wise to assemble a little more information before these are instituted in whole or in part.

We should like to know whether the bacteriologists and their staffs are more subject to some or all infections than, say, the biochemists. If they are not, further action might be limited to situations where experience has taught us to expect danger. If the bacteriologists are shown to be a sickly crew, this should be an immediate call to define those manœuvres which are dangerous and to forbid them, to modify them, or to devise measures of protection. The difficulties of the last are likely to be as much psychological as technical. Almost any protective measure is liable to make work harder or longer or more complicated, and experience in industry has shown that unless the risk to be avoided is both grave and obvious most people prefer to believe that they are the lucky ones.

THE GOWERS LECTURE

THOUGH the name of Sir William Gowers will not be soon forgotten, we are glad that it should now have formal commemoration. Of the sum of money left by his two daughters for this purpose, part has been spent on a Gowers library at the National Hospital, Queen Square—a general library and reading-room, used by patients and staff alike, which besides its own books has a regular supply from the borough of Holborn. (Here is an innovation that surely deserves to be copied by other hospitals interested in breaking down the formality of an institution.) The other part of the memorial is a lectureship for which a portrait medal has been struck. This honour is bestowed by a committee which includes the senior physicians of the National Hospital and of University College Hospital; and it is fitting that their first choice should fall on a man who, like Gowers, has done his work at both of these hospitals—Sir Francis Walshe, F.R.S. The subject of Sir Francis's lecture will be the Nature and Dimensions of Nosography in Modern Medicine, and it will be given on Thursday, Nov. 15, at 8.15 p.m., at the house of the Royal Society of Medicine. Sir Ernest Gowers, chairman of the National Hospital, will preside, and Sir Russell Brain, P.R.C.P., will present the medal. Though a number of invitations have been sent out, no ticket will be required for admission.

7. Keeney, E. L. *Bull. Johns Hopk. Hosp.* 1946, **78**, 113.
8. Shepard, C. C., May, C. W., Topping, N. H. *J. Lab. clin. Med.* 1945, **30**, 712.
9. Wedum, A. G. *Ibid*, 1950, **35**, 648.

MUCOPROTEINS IN WOUND INFECTIONS

IT has long been known that the mucoproteins found in mucus have protective properties of advantage to the human body.[1,2] Moreover, mucoproteins are associated with processes of healing; sufferers from the common cold, for example, know that they are on the way to recovery when their nasal secretions cease to flow like water and instead become viscous and sticky. When a wound begins to heal mucoproteins increase in the exudate, and mucoproteins have a greater capacity to increase viscosity than simple proteins possess.

Experimental work by Howes and Armitage [3] provides some evidence that mucoproteins plus antibiotics may be more effective than antibiotics alone in preventing infection of wounds inflicted so as to crush some tissue in the back muscles of rabbits. When such wounds were contaminated with staphylococcus cultures or floor dirt they were always purulent when first dressed 4 days later. If, when they were made, such wounds were treated by a single injection of streptomycin and sulphonamide, or by various other antibacterial agents, and were also packed open with gauze saturated with the same drugs, they were always free from infection and had healthy granulations four days later. If three hours elapsed between contamination and treatment in this manner, about half of the wounds were infected.

By a double-acid method at least two mucoproteins were precipitated together from rabbit blood in order to test their influence on the course of wounds made and treated as already described. The crushed and contaminated wounds were treated by the injection into their base and into adjacent tissues of 10 ml. either of the antibacterial mixture alone or of the antibacterial mixture with mucoprotein powder dissolved in it to give a mucoprotein concentration of 0·1%. Each of the 10-ml. injections was made by a series of needle insertions through the contaminated tissue to a depth of $^1/_4$ inch in such a way that small quantities were widely distributed around the area of the wound; finally the wound was packed open with gauze soaked in 5 ml. of the solution under investigation. In each rabbit two wounds were made: one was treated with antibacterial solution alone, and the other with antibacterial solution containing mucoprotein. All wounds were then covered with gauze containing petroleum jelly, which was held in place by a circular bandage; no other treatment was given and the wounds were inspected first 4 days later and thereafter at subsequent daily dressings. In a second series of experiments wounds were not treated until 17 and 72 hours after being made and contaminated; these wounds were dressed daily from these times.

Immediate treatment with antibacterial drugs alone prevented infection unless antibiotic-resistant bacteria were present. With 4 hours' delay in treatment 50% of the wounds became infected, with 17 hours' delay 72%, and with 72 hours' delay 85%. The bacteria isolated from these wounds were not resistant to the antibacterial drugs used. For the wounds treated with antibacterial drugs plus mucoprotein the infection-rates were 10% after 4 hours' delay in treatment, 44% after 17 hours' delay (both substantial reductions compared with wounds treated with antibacterial agents alone), but 71% after 72 hours' delay (that is, only a slight reduction, which might have arisen by chance alone). All wounds treated with mucoproteins without antibiotics became infected. Histological examination of the wounds revealed that those of the rabbits given mucoproteins and antibacterial drugs showed a very narrow zone of leucocytes superficial to the granulations, compared with much deeper zones of leucocytes in wounds treated with antibacterial drugs

1. Goldsworthy, N. E., Florey, H. *Brit. J. exp. Path.* 1930, **11**, 192.
2. Florey, H. *Proc. R. Soc.* B. 1955, **143**, 147.
3. Howes, E. L., Armitage, C. *Surgery*, 1956, **40**, 247.

alone. The experiments described are preliminary only, and in the 17-hour-delay group the rather large percentage differences not only represent very few animals but are hard to translate into any number of whole rabbits (72% of 8 as against 44% of 9).

Despite these difficulties for the reader, the work is interesting and deserves thoughtful attention and repetition on a fuller scale. Meanwhile, the authors are interested in the possibility that the mucoproteins may act by protecting crushed tissue against enzymes secreted by the invading bacteria.

NOBEL PRIZEMEN

NOT many Nobel prizes in medicine and physiology have gone to cardiophysiologists.[1] August Krogh in 1920 and Corneille Heymans in 1938 won the prize for their important work on the regulating mechanism of capillary function, blood-pressure, and respiration. Alexis Carrel's contributions on "vascular suture and the transplantation of blood vessels and organs" (as the Nobel citation put it in 1912) finally led to the more recent achievements of vascular surgery and the triumphs of anastomosis in the treatment of cyanotic congenital heart-disease became possible. Willem Einthoven's string galvanometer helped immensely to clarify the nature of almost all the cardiac irregularities and myocardial lesions. Einthoven received the Nobel prize in 1924 for "his discovery of the mechanism of the electrocardiogram." Cardiologists owe an equal debt to Wilhelm Roentgen. His was the physicist's prize—in fact, the first that was awarded, in 1901. Without radiology another considerable advance could hardly have been achieved—namely, that based on cardiac catheterisation under fluoroscopic control. By recording intracardiac pressures and taking blood for oxygen estimations, the nature of malformations can be identified; and, by injecting a contrast medium through the catheter, the heart and great vessels can be displayed. It is for this work that the 1956 Nobel prize in medicine and physiology will be shared by Dr. Werner Forssmann, a urological surgeon of Bad Kreuznach in Germany, and Dr. André Cournand and Dr. Dickinson W. Richards, jun., both physiologists of the Bellevue Hospital in New York.

The story of how Forssmann came to introduce a catheter into his own heart has already been told in our columns.[2] In 1929, when he was a registrar in a small hospital in Eberswalde, north-east of Berlin, he was thinking about rapid ways of introducing drugs into the heart in an emergency on the operating-table. He was opposed to direct intracardiac injections because of the risk of injuring a coronary vessel and thus producing cardiac tamponade. When he inserted a catheter into the cubital vein of a human cadaver, he was amazed at the ease with which it could be passed into the heart. This observation encouraged him to have the experiment carried out on himself. But after the catheter had moved 35 cm. into his vein, it was Forssmann's colleague and not he who flinched, and the experiment was abandoned. A week later he took matters into his own hands, and himself manipulated a catheter from the antecubital vein into his right auricle. Radiographic evidence of the catheter inside the right heart was then published.[3] In the hope of seeing the heart chambers, he injected uroselectan through a catheter in his femoral vein.[4] Although he failed to get a contrast picture of his own heart, beautiful angiocardiograms were later produced in dogs.

It was several years later that Cournand and Richards became interested in Forssmann's technique in the course of their studies on hæmodynamics. In Richards's words[5]:

> "With the possible danger of clot and embolus formation it looked as if it might be a dangerous procedure and as a matter of fact, we had vacillated for 8 years with nothing but a series of somewhat desultory trials in animals and one unsuccessful attempt in man to show for it. In the autumn of 1940, Dr. Cournand with Dr. Ranges finally carried the procedure through successfully. The technique, clumsy at the start, has been perfected, especially by Dr. Cournand, Dr. Riley and Dr. Breed, and with practice proved to be remarkably easy, safe and painless, no serious untoward effects having been encountered in over 250 catheterizations."

First, Cournand and Ranges[6] used the catheter to measure cardiac output in man by the Fick principle (in 1905 F. Bleichroeder passed catheters into his own veins, but he had no X-ray control[2]; and it was in 1930 that Klein[7] used Forssmann's technique to measure cardiac output in man by the Fick principle). Then Cournand and Richards, with many colleagues, did much important work on cardiac output and pressure in animals and man under normal conditions. Accounts of the dynamics of congestive heart-failure, chronic pulmonary disease, and congenital malformations followed. Soon after the technique was established, Richards used it for his investigation into the hæmodynamics of traumatic shock in man.

Cardiac catheterisation was soon adopted in this country. McMichael[8] and Sharpey-Schafer applied it to investigate circulatory failure and conditions associated with high and low cardiac output. The great value of the method was established in the diagnosis of congenital heart-disease[9] at a time when Taussig had completed her celebrated work and Blalock, Crafoord, and others had begun their surgical ventures on the tetrad of Fallot and coarctation of the aorta. Cardiophysiological laboratories soon sprang up in many cardiac centres in the United States and elsewhere. "Physiology had broken out of the laboratory and invaded the hospital ward."[10] Now, the physiologist has become a vital member of a team comprising a physician, radiologist, cardiac surgeon, and anæsthetist.

In experienced hands cardiac catheterisation is now a safe procedure. In 1953, a committee of the American Heart Association,[11] under Dr. Cournand's chairmanship, reported less than 0·1% mortality in 5691 catheterisations. They concluded that, in the light of our present knowledge and experience, this mortality could be further reduced.

H.M. MEDICAL INSPECTORS OF FACTORIES

IN announcing their plans for the enlargement and partial decentralisation of the engineering and chemical branches of the Factory Inspectorate of the Ministry of Labour, the Government do not go into the future of the medical branch.[12] "Much thinking," they say, "is now taking place on the best way to develop industrial health services and it would be inopportune to make any fundamental changes in the organisation of the medical side of the Inspectorate in advance of decisions on these questions of policy." It is satisfactory, at least, to have this recognition that the development of industrial health services may call for considerable alteration in the structure of the department. Such alteration is thought by many to be already overdue.

1. Schück, H., et al. Nobel, The Man and His Prizes. Oklahoma, 1951. Stevenson, L. G. Nobel Prize Winners in Medicine and Physiology 1901–1950. New York, 1953.
2. Benatt, A. J. *Lancet*, 1949, i, 746.
3. Forssmann, W. *Klin. Wschr.* 1929, **8**, 2085.
4. Forssmann, W. *Münch. med. Wschr.* 1931, **78**, 489.
5. Richards, D. W. jun. *Harvey Lect.* 1944, **39**, 217.
6. Cournand, A. F., Ranges, H. *Proc. Soc. exp. Biol., N.Y.* 1941, **46**, 462.
7. Klein, O. *Münch. med. Wschr.* 1930, **31**, 1311.
8. McMichael, J. *Advanc. intern. Med.* 1947, **2**, 65.
9. Cournand, A., Baldwin, J. S., Himmelstein, A. Cardiac Catheterization in Congenital Heart-disease. Commonwealth Fund, 1949.
10. Bing, R. J. *Advanc. intern. Med.* 1952, **5**, 51.
11. *Circulation*, 1953, **7**, 769.
12. Cmd. 9879. H. M. Stationery Office. 1956. Pp. 48. 2*s*.

Special Articles

A REVALUATION OF TERRA SIGILLATA

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TERRA SIGILLATA or Lemnian earth, was a red earth made into tablets with the addition of goats' blood, stamped with a proper seal, and used for many maladies, most notably for poisoning. It was mentioned by Dioscorides in 40 B.C., and Galen, two centuries later, was also interested—"I was pleased to experiment with them, and took away with me 20,000 of these seals." He claimed some good results, but does not appear to have controlled them with dummy tablets. The demand for Lemnian earth exceeded the supply, which was augmented by similar earths from other places, notably Strigian earth (see figure). Terra sigillata was in all the early pharmacopœias, including that of the Royal College of Physicians in 1618; and its latest official mention was in 1848. An excellent historical account of terra sigillata was given by Thompson (1912); and it is from his paper that I quote the following "case-report," which is in the form of a testimonial:

"We Wolfgangus Earle of Hohenloe, Lorde of Langenburg, &c. Do openlie make knowen unto all men by these my Letters Testimoniall, that there came lately before me at Langenburg, my welbeloved friende, Andreas Betholdus of Oschatz, and declared unto mee that he had a most excellent kinde of Terra Sigillata, which was not alonely of great force against sundrie diseases: but also a most undoubted remedy against all manner of venemous poisons, as had beene prooved by sundrie witnesses upon a great number of dogges, which made me also desirous to see the triall of it. It happened at the same time, that one called Wendel Thumblardt was by our Lieuetenant of Langenburg for certaine fellonies imprisoned, who being examined by our Justices, confessed himself guilty of a great number of robberies: And therefore brought to the barre was condemned to be hanged. Being yet deteined in prison, and coming to his eare that there was such a medicine, so soveraigne against sundrie sicknesses, and the most deadly poisons, has made humble request as well by his parents, as by other his friends, of which there were present no small number, desiring for the mercie of God, and respect of his poor life, that being thus condemned, hee might have given unto him the most deadly poison that might be devised, whereby a perfit triall might bee had of the worthines of medicinable earth. And in this respect, not onely for this pittifull request of his: but also for the commoditie and benefite of all Christendome (if so be the medicine proove answerable to the report), pardoning the offender, we graunted his life upon that condition. Therefore the day of the date of these presents, in the presence of our selfe, and our welbeloved Cosin the Countie George Friderick of Hohenloe, and Lord in Langenburg, and in the presence of all our Nobilitie and Commons, the said patient received a dram and a half of Mercurie Sublimate, mingled with Conserve of Roses, and immediately after it he drank a dram of the Terra Sigillata in olde wine. And albeit the poison did in the judgement of our learned Phisition George Pistor, Doctor in Phisicke, and John Lutzen our Apothecarie, who were both by him all the while, extremely torment and vexe him: yet in the end the medicine prevailing overcame it, whereby the poore wretch was delivered, and being restored to his health was committed to his parents. Whereas therefore the foresaid Andrew Berthold, hath humbly required to have our Letters Testimoniall for his farther credite, wee have thought good for the furtherance and advancement of the truth, to graunt him these our Letters, signed with our seale Manuell. Given at Langenburg the 25. of Januarie, in the yeare of our Lord. 1581."

If we dismiss the Conserve of Roses and the olde wine as active agents in this strange event, we are left with the possibility that terra sigillata did in fact protect against a dose of 6 g. of mercuric chloride, a substance which has generally caused death when given in amounts of more than 2 g. (Sollmann 1948) and has often been fatal in much smaller amounts. The composition of a sample of terra sigillata (see table) suggests that it could have an ion-exchange action, taking up mercuric ion and replacing it with innocuous calcium or magnesium. This hypothesis is quantitatively admissible, for the amount of mercury ingested was 44 m.eq.; the exchange capacity of the terra sigillata cannot be precisely defined from the information available, but probably fell between 32 and 64 m.eq., depending on the valence of the silicate complex present in the actual earth.

COMPOSITION OF SAMPLE OF TERRA SIGILLATA (THOMPSON 1912)

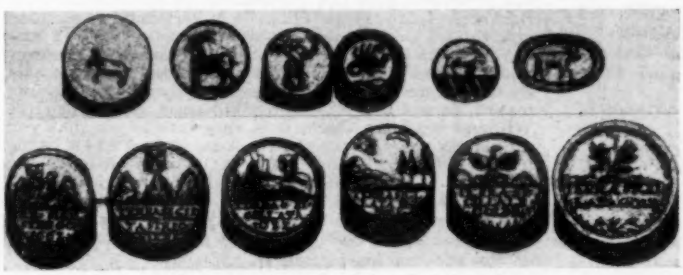
Substance	Proportion (%)
Silicates	37·23
Ferric oxide	4·08
Aluminium oxide	13·51
Calcium oxide	22·90
Magnesia and alkali oxides	1·50
Water and carbon dioxide	17·72
Moisture, determined by heating at 130°C	3·06

Repetition of the original experiment with more precise quantitative control did not seem possible; but some information has been obtained on the effect of more conventional ion-exchange agents on the uptake of heavy metals in vitro and in vivo. Sulphonated polystyrene resins charged with H, NH_4, K, or Na effectively removed mercuric ions from aqueous solution. A resin was prepared charged with cupric ion (1·6 m.eq. per g. resin); when this was exposed for 24 hours to solutions resembling gastric and intestinal contents in their pH and electrolyte composition, the loss of cupric ion from the resin was less than 0·2 m.eq. per g. of resin.

Two observations have been made on the in-vivo behaviour of exchange resins and metallic cation, using iron as a relatively non-toxic substance. In the first experiment, a resin was prepared with 8·25 mg. of ferric iron per g. resin, and 10 g. of this was taken by mouth; resin was recovered from the fæces by sieving, and found to contain 3·7 mg. Fe^{+++} per g. In the second experiment, 0·5 g. of ferrous sulphate in water was taken, followed 10 minutes later by 10 g. of resin charged with hydrion; the resin later separated from the fæces was found to contain 1·85 mg. Fe^{++} per g. resin, which represents an uptake in vivo of only 10% of the administered iron.

These in-vivo results do not suggest a very bright future for exchange resins in the treatment of heavy-metal poisoning; but there is a discrepancy between them and the in-vitro results, and even more so between them and the recovery of Herr Thumblardt. Two reasons for this discrepancy may be put forward:

(1) Because of the need to recover them from the fæces, coarse-mesh resins had to be used. In vitro, these are much



Above, Lemnian seals. Below, Strigian seals.

less efficient in taking up cations than the fine-mesh resins. Terra sigillata may have been an impalpable powder, like modern fine-mesh resins.

(2) The composition of resin obtained from stools may be very different from its composition in the absorptive part of the alimentary tract. This has been clearly shown for Na and K by Spencer et al. (1954); and it may be that heavy metal ions on the resin are safely steered past the area of absorption, only to be exchanged for potassium in the colon.

While no strong claims can be made for exchange resins as antidotes to heavy metals, the matter is probably worth further study; and it should at least be noted that in vitro they are ten times as efficient as milk and active charcoal, which are often recommended in this context.

We have given 15 g. of finely powdered resin to a patient who had taken a large but unknown number of ferrous-sulphate tablets; he had no ill effects attributable to the resin, and made a good recovery. There seems no good reason why resin should not be given after gastric lavage has been completed in patients who have taken heavy metallic poisons.

SUMMARY

Terra sigillata, a time-honoured medicament, may have had some effective action in metallic poisoning, by virtue of its ion-exchange properties.

Experimental evidence bearing on this point is reported; and it is suggested that ion-exchange resin may have a modest place in the management of patients who have ingested metallic poisons.

REFERENCES

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Spencer, A. G., Ross, E. J., Lloyd-Thomas, H. G. L. (1954) *Brit. med. J.* i, 603.
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Conferences and Congresses

CARDIOLOGY

A CONFERENCE on Medical and Surgical Cardiology, organised by the postgraduate medical education committee of the University of Glasgow and the Royal Faculty of Physicians and Surgeons, was held in Glasgow from Oct. 1 to 5.

Cyanotic Heart-disease

Prof. W. E. ADAMS (Chicago) said that today the so-called "blue baby," if presented for surgical treatment before the myocardium was too severely damaged, had a very good chance of being considerably improved and indeed of being converted into an almost normal child. The mortality of operation was not great (under 10%) considering the benefit to be gained and the otherwise hopeless outlook.

All types of operation—anastomotic, "closed" valvotomy, and open operation—retained their place. Although the Blalock type of operation had sometimes effected only temporary improvement, it was in some cases (pulmonary atresia) the only procedure possible. In other cases, it might be done in the hope that with improvement in the general condition a more radical operation would prove possible.

Mitral-valve Disease

Mr. ANDREW LOGAN said that in about 80% of cases of mitral disease the results of surgery could be described as "worth while," but he preferred to dwell on the remaining 20%. He analysed a follow-up of 250 cases operated on in the past five years, noting especially old age, the presence of auricular fibrillation, mitral calcification, intra-auricular clot, aortic-valve disease, and gross cardiac enlargement in a high proportion. Even so, it was impossible, he thought, to prophesy accurately the "good case."

Mr. Logan advocated the use of a dilator for mitral commissurotomy, by a transventricular approach. In his opinion, only in a small proportion (3%) of cases could the surgeon restore normal valve function. The percentage of "good" results in patients over 50 years old was much lower than in the series as a whole—only 38%.

Dr. J. H. WRIGHT emphasised that rheumatic heart-disease still presented difficulty to the physician. In the problem case, there was no completely reliable method of deciding the exact lesion of the mitral valve and its importance in producing symptoms. Not all cases of mitral disease were suitable for surgery—indeed less than 30% of 1500 such patients referred to Glasgow Royal Infirmary had been accepted for operation. There was in fact a group of patients with mitral-valve disease who could live long and active lives and would not require operation at all.

Coarctation of the Aorta

Professor ADAMS said that, in experienced hands, the operation for aortic coarctation now carried a mortality of only 2–3%, and prospects of significant improvement were excellent. He emphasised the importance of operating early enough. In his view, coarctation of the aorta ranked next to patent ductus arteriosus and uncomplicated pulmonary stenosis as a disorder capable of relief by surgery.

Professor W. A. MACKEY, referring to the surgeon's technical experience, said that in this country we had been slower than American workers to appreciate the value of animal work in this connection—a deficiency which had now been made good.

Mr. R. S. BARCLAY gave an account of his experience with young children—some of them seriously ill even at a very early age and requiring operation almost as an emergency measure. Some of these infants, who otherwise would have had little or no chance of survival, could now be given a fine chance of an active life.

Mr. W. H. BAIN gave an account of aortic grafts for cases where approximation was impossible after excision of the coarctation. All, including homografts, had disadvantages. He gave an account of his own experimental work with 'Ivalon' sponge and showed by histological specimens how such a graft became enveloped by porous tissue. The danger-point with this material was the line of junction with the aorta.

Before Our Time

MANY years ago I was dining with the late Sir William Hale-White and he told me the following story:

When he was a young man he once asked Sir Thomas Barlow which came first in pulmonary tuberculosis, the fine crepitations or the impairment of percussion. And Barlow replied: Hale-White, it is very interesting that you should ask me that question because when I was a young man I once asked Sir Andrew Clark. And Andrew Clark replied: Barlow, it is very interesting that you should ask me that question because when I was a young man I once asked Theodore Williams. And Theodore Williams replied: Clark, it is very interesting that you should ask me that question because when I was a young man I once asked Louis in Paris. And Louis replied: Williams, it is very interesting that you should ask me that question because when I was a young man I once asked Laennec. And Laennec said that the fine crepitations came before the impairment of percussion.

Told by Sir HENRY TIDY, *at the London Hospital dinner, 1956.*

The Widdicombe File

XXXV. CLINICOSIS (2)

DEAR NEPHEW RICHARD,

My heartiest congratulations on your Membership, and on the consequent enjoyment of your full baptismal name. Forgive me if I still think of you as Dicky Boy and address you in an avuncular tone. Some crusty old uncles might have snorted at the shallowness, the callowness, of your letter, but I can see the sterling gold of your character peeping through the dirty pound notes you collected from the County Treasurer. I honour you the more for going slumming in the clinics; it is more than many M.R.C.P.s have ever done. Go west, young man; go east, young man. Go any direction you damn well please, but don't let yourself settle too soon into the narrow stream of consultant medicine. You have peeped outside the hospital door, stay out in the fresh air for a while. It won't hurt you to puzzle out what is normality, and later on you will realise that there is a hopscotch pitch chalked where you want to park your Jaguar.

You ask why our clinics exist? It saddens me, because it emphasises my greying hairs. The answer, my dear Dick, is that you are too young to remember the 1920s and '30s, and maybe medical education has become more technological than I feared. The reason for our clinics is simply that no-one else did the work or does it now. Of course no answer is really as simple as that, but it involves historical facts, the changing fortunes of peace and war, the blitzed framework of the N.H.S., the post-war jockeying for power and prestige, insurance against the turning wheel of history. In the shadow of the Managerial Revolution of our times lurks that craven fear of overlapping which creates such deplorable gaps in our professional services, the chilly administrative iconoclasm which can lead only to a philosophy of nihilism.

No my lad, just you pull up your trouser legs and see if you are not still a bit knock-kneed, and ask your mother why she had two cæsarean sections (instead of letting you have the tentorial tear I often thought you richly deserved). Some of my fellow students, I regret to say, nicknamed her Rickety Rosamund.

Don't you remember on your way to school seeing all those men standing on the edge of the pavement, propping up the wall, queuing for the dole? Well, they had wives and kids whom perhaps you didn't see. It cost money then to go to the doctor; it cost a hell of a sight too much to buy butter and real cow's milk. Bread and jam for the nippers it was, and tightening the belt all round. You have lived all your impressionable years in a fool's paradise of easy money and full employment, television sets, hire-purchase, and heavily subsidised council houses. Jack's better than his master, and what's the use of saving in galloping inflation? There will be grants for this and grants for that—there will until the real value of money runs out. Do you think it so improbable that we may get back to where you came in? The growth of our personal-services clinics after the first world war, and their help to tide over the 1930s, were real enough.

But that does not mean to say that we should venerate them solely for their past achievements. I agree with your fresh youthful viewpoint that they should be subject to constant critical review, left free to adapt themselves to changing needs, but imbued with that conservative caution which has always been the strength of England. It is a good thing to replace an ancient building by a modern skyscraper, but not to leave a pile of rubble on a vacant site.

"So what, if general practitioners have not time to weigh and immunise?" you ask me. Surely your Censors have not sold their birthright to the Metropolitan Life? Does no-one care about the rôle of the weighing-machine in detecting the early signs of pre-eclampsia, or is Australia too far away to be heeded? Are not the actuarial figures on obesity of some interest, or do we hurtle our adults into diabetes, fallen arches and coronaries, eclamptic fits and anuria, our children out of the correctable years? In the 1930s we weighed the kids, not for any academic interest, but to see that they got the extra nourishment which their parents could not afford to provide. That was when you were growing up too, remember? Those of us who got up out of bed to do tracheotomies in the night, or pump serum into hopelessly grey little bodies, will never begrudge the time spent on immunising. Perhaps it's a pity you didn't see smallpox when you did your National Service. We haven't yet reached a Luddite philosophy in clinical medicine, have we?

Now Dick, I am not going to let you slide away from antenatal clinics so easily. You may be lucky where you are to have an impeccable level of general-practitioner care, but I can assure you that there are many areas in this country where maternal morbidity is still far too high, and where perinatal mortality is still too grim. Women still go off into eclampsia without anyone caring to take the most elementary precautions; they arrive for delivery with seriously depleted hæmoglobin levels, without blood tests, with undetected albuminuria and soaring systolic pressures, with placenta prævia. Ask your labour-ward staff. No, my dear Dick, you don't have to serve on the Cranbrook Committee to realise that all is far from well in our obstetric services, unless England is content to muddle back to the same old toll of death and disease. Mothers come home with sore nipples, a hit-and-miss layette, and some of them are not quite sure which end of the baby to stick in the bath. I know that there are many general practitioners who do all this and more in their care of expectant mothers; but, as you say yourself, some have over-large lists and time is too short for more than a pat on the tum and a dollop of wishful thinking.

The antenatal clinics had their uses, you know, before they became buried under the sneers and the jealousies of our divided maternity services. Even the hospital obstetricians' jibe that the doctor conducting the clinic did not deliver the baby has a hollow ring. What continuity is there now for the patient whose general practitioner is not on the obstetric list, for the booked hospital case, for the ever-changing hospital staff, for the lack of guarantee that the consultant will be available unless her cervix obliges to suit his engagement book? I am all for a woman having her baby within reach of full hospital facilities, particularly the primipara or the elderly multipara, but I see little justification for running down the local-authority antenatal clinics so long as they are providing a check supervision service if it is not in fact being obtained elsewhere. And the last nine words are the crucial ones. Apart from the technical control of pregnancy, the clinics provide much-needed instruction in the hygiene of pregnancy, relaxation exercises, better understanding of delivery, preparation of clothes and home for the baby, and mothercraft lectures and advice from the health visitors who go on visiting the family long after the obstetrician has coveted the hospital bed for his next case.

Now to take your Infant Welfare Clinic. I see no excuse for the cold waiting-room. The caretaker needs a rocket up his pants, and it is up to you to see that

he gets one. I am sorry that your room resembles the vestibule of a public lavatory; mine used to smell like one as well. During the blitz we were rather thankful for the underground variety, they made quite useful first-aid posts. I can see that it must be hard to emerge from hospital life and have to rough it without the sort of taps you can turn on with your elbows; but quite a lot of practical Christianity has been done in a church hall with a screen and an examination couch. Better than no help at all, don't you think? Maybe we should be humble enough to recognise that many of the attending mothers come along to natter among themselves in the waiting-room, a pool of self-help and mutual support, just as you and I wander round to a clinical meeting not so much to stare with awe at some unpronounceable gentleman's variety of muscular dystrophy, but to get that comfort and morale boost from our colleagues, be they consultants, G.P.s, public healers, or any of the other odd bods of our profession. What matter if the good women collect a multiplicity of advice? Their common sense will discard the more unpractical prescriptions, and the odds are that Grandma's opinion will hit the jackpot. What matter if weighing the baby does arouse the competitive spirit? We are getting so keen today on abolishing under-privilege that soon we shall all be equally privileged or under-privileged: I wouldn't know which. What matter if the baby does overfeed? It will puke up the overflow; mopping up teaches the lesson quicker than preaching. Our clinics are following the Bantu convicts' experiment on diet and coronary disease. At least one baby has firmly decided not to emigrate.

Maybe the cold room had something to do with the poor attendance at your Toddlers' Clinic, but it is no good your Health Visitor sitting on her hunkers. She ought to get after the mothers and be satisfied that someone is keeping an eye on the kids. The great point is that the kids get the attention, not so much who actually gives it. Passing the buck is a poor way out: nearly as bad as factional bickering within our own ranks.

Much the same goes for your School Clinics. Someone has to do the rapid screening in the schools. If it is not done by a doctor it will be done by the teachers. Is it not better to pick out the cross-eyed, the deaf, the adenoidal snivellers, the flat-footed, the simple-minded, and speed them on their way to early consultant help? Most teachers would say so. Are we to risk leaving those children to lay caprice and apathy if their parents are not stimulated to set the medical machine into motion? Obviously their general practitioner would deal with them faithfully if they were brought to see him, but he finds it no part of his contract with the Executive Council to go out on his own bat and look for them in the highways and byways.

Of course a general practitioner could conduct a child-welfare clinic as well as anyone: so could a consultant pædiatrician: so could the medical officers who do it. Each would bring to bear his own valuable contribution of outside experience. We could end up with a triumvirate brains trust. You probably know that some clinics are staffed by general practitioners; but by and large the post is not attractive to them, and the appointment is not always viewed with favour by their competitors, human nature being what it is. I think you ought to do quite a lot more knocking around the outside world before you return to your monastic order. Only then will you be able to see a true reflection from the gold-headed cane. Tolerance and Charity are mature flowers.

Welfare, my dear Nephew, is not some automatic end-product of the National Health Service Act. I think that you will have to seek its roots in Ancient Greece, and follow it along that broad continuum of history to see its religious, secular, and philosophical ramifications in what we are pleased to call our civilisation. Did the Censors not question you on Plato? But be of good cheer, Dick, your eyes and your heart will teach you all you desire, if only you can bring your soul to realise that an M.R.C.P. need not stand in your way. Therein lies the key you have temporarily mislaid—the key to enchantment.

More in sorrow than in anger,
I remain your loving uncle,
THOMAS COBBLEIGH.

Medicine and the Law

Careless Death Certificates

THE need for care in certifying the cause of death does not always seem to be fully understood. The requirements are made quite clear on pp. ii to vi of the book of certificate forms and could be studied with profit by many. Morbus cordis, anæmia, debility, and senility still appear regularly as causes of death despite the comprehensive list of undesirable terms given on pp. iv, v, and vi. Not only are national statistics based on these certificates, but much trouble is caused to registrars and coroners by slovenly certification. The queries which arise from the inaccurate or illegible certificate may hinder funeral arrangements, cause distress to relatives, and even raise suspicions that the doctor may have been less than sufficiently careful in his handling of the case.

The only person who can certify the cause of death is the doctor who was in attendance during the last illness. "In attendance" has never been legally defined; perhaps this is as well, for the phrase still means what it says. The registrar cannot accept a certificate where the doctor "in attendance" has not seen the deceased for fourteen days. It is surprising how often practitioners issue certificates even though a much longer interval has elapsed. In a recent case a doctor gave a certificate for a patient he had not seen for nearly four months; and he had not even viewed the body. The coroner found that death was natural; but the same thing might happen in the case of homicide.

The arbitrary period of fourteen days is administratively sound; but could a conscientious doctor say he had been in attendance if he had left his patient dying for so long? In the case of a sudden or unexpected death he clearly does not know the cause, and can only be guessing. If he does know the cause, and it is natural, he may issue a certificate; the essential point being accuracy.

At a recent inquest [1] where a house-surgeon admitted making a "slip of the pen" in filling in a death certificate, the coroner criticised hospital rules which seemed to require the house-surgeon to sign the certificate because she held a particular post, rather than because she knew the cause of death. It is hard to believe that a hospital could make such rules, which are surely invalid as purporting to override the provisions of the Births and Deaths Registration Act of 1874. Perhaps it is a hospital custom that the house-officer shall sign the death certificates. But, whether custom or rule, it must be disregarded. Only the doctor in attendance, whatever his appointment, can complete the certificate. In hospital practice this often is the house-surgeon, but it could equally be more than one member of the staff. If such a person undertakes to give a certificate, he must be sure of the cause of death and must omit nothing from his certificate. If he does not know, he must inform the coroner. And there must be no "slip of the pen."

1. *Manchester Guardian*, Oct. 10, 1956; *Kent Messenger*, Oct. 12.

Public Health

Teams

THE rôle of the M.O.H. in the health team was again discussed by Miss P. M. Hornsby-Smith, parliamentary secretary of the Ministry of Health, in her speech last week at the dinner of the Society of Medical Officers of Health.

She claimed that whereas at first in the National Health Service the emphasis was on hospitals, in the last three or four years it had been shifting towards prevention and domiciliary services. The M.O.H. was not only the link between local authority and general practitioner: as leader and creator of the domiciliary team he was responsible for the local-authority personnel working under the clinical leadership of the family doctor. Good general practice was the core of the health service, but it was impossible without the supportive services organised by the M.O.H. Public health had reached a stage when further progress depended very largely on the ability of the M.O.H. to work with his clinical colleagues: its focus had moved from drains and pure water to problems with the home. The greatest success the M.O.H. could have was that clinical colleagues should come to accept his aims and speak with his voice.

Dr. J. D. Kershaw, the president, wondered how the M.O.H. could be leader of the domiciliary team while the family doctor was its clinical leader. "But aren't we worrying too much about captaincy—who leads whom—when we should be worrying about who works with whom?". The integration needed was that of a string quartet.

The M.O.H., Dr. Kershaw said, required more publicity, of the right kind. (The B.B.C. had given only five minutes to the society's centenary.) To hide one's light under a bushel might be good policy for a gentleman but it was bad policy for a lighthouse keeper. The M.O.H. should show himself willing and fit for social leadership in his community. The day had passed when enforcement of legislation could produce public health; now only leadership could do it. Moreover, in saving the lives of thousands of infants we incurred a moral responsibility for what happened to them. How far were we fulfilling it? Ours was a sick society: it still tolerated poverty; it still put the interests of property before those of public health; and it still thought of war as the logical conclusion of politics. But the United Nations had been wrong in defining health as a state of being: it was a way of living. From now onwards the biggest single cause of ill health would be ignorance of how to live.

Now that epidemic diseases were coming under control it was more and more important, Dr. Kershaw thought, that the M.O.H. should remember that he was a physician. One of the great problems facing us was the need to humanise the Welfare State—to remember that "public health is people." The M.O.H. should administer his services, not as a bureaucrat or as officer of an authority, but as a physician; and he should be in direct partnership with clinicians.

Hospital doctors, said Dr. Kershaw in conclusion, tended to be isolated, and tended to think of pathological conditions in isolation; but diseases had to be held in that inconvenient container, the human body, and it was the M.O.H. that knew the social environment. Just as the physical-medicine departments of our hospitals had developed from a room in the basement, labelled "Massage," he believed that departments of clinical social medicine must be created where now there was no more than a room for the almoner; and the M.O.H. could then play his part, on a basis of equality, in the work of the hospital team. In rejecting the trivial suggestion of the Guillebaud Committee that the M.O.H. should join their staff as epidemiologist, hospitals had been right—though for the wrong reasons. "We have a right to the front door, not to some half-open back door."

Tuberculosis in Africa

The spread of tuberculosis in Africa was considered at a session of the African regional committee of the World Health Organisation held in Luanda, Angola, last month. More efficient case-finding is thought to account for only part of the increase in tuberculosis widely reported. The "often illusory fascination of the big towns" leads to disintegration of the tribes and the growth of city slums, with associated overcrowding, alcoholism, and malnutrition. Most illness appears to be caused by the human type of bacillus.

In the committee's opinion the first step in attacking the disease is the extension of epidemiological surveys to obtain exact data as to where the prevalence is highest; for in many areas no reliable statistics are available. After this a combination of mass vaccination with B.C.G. (by whichever route is found most suitable) and of conventional treatment of infectious cases, with isolation where necessary, is hoped to reduce the incidence of the disease. All over Africa treatment centres are now being established, and they will have much hard work to do if tuberculosis is not to replace malaria and the treponematoses as the major endemic disease in Africa.

Emulsifying and Stabilising Agents in Foods

Emulsifying and stabilising agents in foods should be subject to statutory regulations, according to the preservatives subcommittee of the Food Standards Committee. In a report[1] issued by the Ministry of Agriculture, Fisheries, and Food the subcommittee suggests that, as with anti-oxidants and colouring matters (on which it has already reported), the use of these agents can best be controlled by specifying, in a "permitted list," the substances which may be used. The subcommittee recommends that the addition of such agents to milk should not be allowed; that of the permitted substances only superglycerinated fats and stearyl tartrate should be allowed in bread; and that the existing prohibition on the use of thickening substances in cream should be extended to cover reconstituted cream.

Before deciding what action should be taken on the subcommittee's recommendations, the Ministers concerned will consider representations from interested parties. Such representations should be sent by Nov. 30 to the Assistant Secretary, Food Standards and Hygiene Division, Ministry of Agriculture, Fisheries, and Food, Great Westminster House, Horseferry Road, London, S.W.1.

Deaths from Coronary-artery Disease

In the U.S.A. in 1950 the age-adjusted death-rates for coronary-artery disease in white males and females were about twice as high in some States as in others. Enterline and Stewart[2] find that these geographic differences are probably not due to differences in standards of diagnosis; nor do they seem to be due, to any large extent, to differences in urbanisation.

Third Quarter in England and Wales

The Registrar-General has announced[3] provisional figures for the third quarter in England and Wales. Live births registered numbered 173,586, representing a rate of 15·5 per 1000 population—the highest rate for a September quarter since 1953. There were 104,118 deaths registered—a rate of 9·3 per 1000 population compared with 9·1 in the third quarter of 1955 and 9·3 in the same quarter of 1954. The infant-mortality rate was the lowest ever recorded for a September quarter—20·3 per 1000 related live births. In 1938 the figure was 42·5.

Education of the Handicapped Pupil 1945–1955.—The Ministry of Education have reproduced, as their pamphlet no. 30, the section of their annual report for 1955 which reviewed the progress made, since the Education Act of 1944, in developing facilities for the education of handicapped pupils. Copies of the pamphlet may be had from H.M. Stationery Office (2*s.*).

The text volume of the Registrar-general's Statistical Review of England and Wales for the year 1953 has now been issued (H.M. Stationery Office. Pp. 250. 9*s.*).

1. Food Standards Committee: Report on Emulsifying and Stabilising Agents. H.M. Stationery Office. Pp. 15. 9*d.*
2. Enterline, P. E., Stewart, W. H. *Publ. Hlth Rep., Wash.* 1956, 71, 849.
3. The Registrar-General's Weekly Return no. 41, 1956. H.M. Stationery Office. Pp. 20. 1*s.* 3*d.*

In England Now

A Running Commentary by Peripatetic Correspondents

I PULLED up the car for lunch and switched on the radio: it was *Workers' Playtime*, and the singer had reached the last bars of her song. Some sporadic clapping followed, and she then began to sing *Que sera, sera*, the theme song of *The Man who Knew Too Much*; it was a light, pleasant voice, singing without a trace of "scat." A gentle bass rumble accompanied the chorus of the first verse, but this swelled in volume during the second chorus, and at the end of the third verse, a full-throated roar drowned the orchestral accompaniment. Then followed a tornado of applause, sustained and terrific in volume; the microphone picked up the nervous embarrassed laughs of the singer and compère.

Of course such an unmistakeable catharsis, such an impressive group abreaction, must have been over-determined; and I wondered what the factors might have been. This was much more than a tribute to the personality of the singer.

The tune is a plaintive little air, difficult to shake off. I hear it hummed and whistled everywhere; it is particularly popular among the boys of the approved school I visit. In the film it is introduced as part of the bedtime ritual as the mother puts her small son to bed, the night before he is kidnapped. Then it recurs later when the mother, still seeking her lost son, invites herself to the presidential reception at the embassy to which she suspects her boy has been abducted; asked to sing, she sits down to the piano and sings *Que sera, sera*, at the top of her voice, hoping the sound may reach her little boy; and the next sequence, calculated to bring a tear to the manliest eye, shows the youngster locked in the attic, whistling the tune back.

Was that the important factor—separation anxiety—and the prospect of its relief? How many of the older men in the factory audience had left their children behind, when they served in France, Germany, Italy, North Africa, Burma? How many had been prisoners-of-war? How many of the younger workers had been evacuees fifteen years ago, wondering if they would ever see their mothers again? And even if they had not seen the film—the words of the song, "What will be, will be," do they not strike a chord that resonates the almost Arabian fatalism so commonly observed in my outpatient clientèle? The little man manœuvred by forces he does not understand and cannot control.

I drummed the little tune out on the steering wheel—syncopated it is true—but wasn't the basic rhythm familiar? Surely the rhythm was that of the *berceuse*, the cradle song, the lullaby, the first music we ever heard, when worn out by infant struggles and frustrations, we were coaxed to sweet oblivion. Separation anxiety, masochistic despair, echoes of long-forgotten music—did these explain that almost terrifying applause? I wonder.

* * *

"I still inhabit this divine bay reading dramas and sailing and listening to the most enchanting music." The guide-book says that no-one can pass the house without being deeply moved and Shelley's words, carved in marble on its wall, would soften the most adamantine heart. The house is comely and well suited for that galaxy of excitable talented individuals—tears and laughter and inspiration flowing free. Who could help being moved at the sight of the old iron gate, the triple-arched portico, and the plain wooden door with rusty knockers? It is now a little lifeless and shabby but not decayed, and it seems to be occupied. San Terenzo is comparatively quiet so that one can dream at leisure; Shelley passed this way, the scenes unfold in the warm sunset light, and the hand reaches for Queen Mab.

* * *

It was some little time before I realised the part that racial memory must play in the life of the district. Successive waves of Romans and Danes, with their homely little ways of killing off the male population and elders and removing the more comely females and children for their own use, have imprinted a caution which can almost be felt by its formless pseudopodia, and a subtlety of action which is tortoise-like. Movement occurs, but in a direction and at a time no-one can predict. For instance I rarely, if ever, catch my gardener digging; he always appears to be leaning on his spade enjoying a cigarette and the birdsong. Yet each time I look he is magically four spits farther on, and by the end of the afternoon the bed is dug.

Thus I imagine the business of life must have been carried on under overseers who carried short swords or great axes instead of cigarette-lighters: to whose questions one could never know whether "Yes" or "No" would be the right answer or the last.

Masters of such uncertain or unpleasantly certain temperament would probably have employed wine and food tasters, and the memory of this sinecure seems to have been imprinted equally indelibly on the genes dealing with the development of the unconscious. This seems the most probable explanation for my honorary appointment as wine-taster to my patients. In winter all sorts of bottles are brought out, and if I did not have a stomach-wall like sharkskin I should have had holes burnt in me long before this. The stuff is usually far too young. In mid-ferment so to speak. It looks like palm-juice in which milk and blood have been mixed, rather slimy to taste, frothing gently and with a cruel sting in its tail. Occasionally I am presented with a bottle of really mature wine which is good—either rhubarb, bullace, or mead. When it is nettle, dandelion, or some other form of local hemlock I refuse with the utmost gentleness and subtlety, honoured, but at the same time a little chastened to think that my advice may have been a little too authoritative.

* * *

The specimen for "amœbæ, parasites, and ova please" usually reveals its presence on the reception bench of the laboratory after the messenger has returned to the safety of her ward. The other day a houseman appeared in person, bearing the familiar truncated vessel covered by a white cloth marked with the emblem of St. George. This in itself was a sufficiently remarkable phenomenon to excite the interest of the pathological staff, and we all adjourned to the bacteriology laboratory to examine this rare and unusual specimen.

It was a slender white object 20 cm. in length. The surface was smooth and marked by a triple helical groove: the anterior and posterior ends were indistinguishable. Although not recognised as a diagnostic criterion in textbooks of helminthology, the tensile strength was such that the clinical pathologist, by winding the ends round his fingers and pulling, was unable to break it.

The diagnosis was only made with the help of a careful clinical history from the patient. She had opened a parcel shortly before the Senior Physician's weekly ward-round was due to begin. A junior nurse, in her hurry to remove the débris, had inadvertently left behind part of the string. The patient, evidently remembering the method used by spies of fiction for disposal of incriminating documents, had disposed of this evidence of misbehaviour by a hurried act of deglutition.

* * *

It was my colleague's turn to take the candidate in the surgical anatomy viva. He waved the victim into a chair and laid a patella on the table before him. "What fracture will result if this patella is forcibly struck from in front—like this," he said; and hit the patella smartly with a clavicle, with which he was now toying. A large piece fell off the clavicle. "A stellate fracture of the patella, Sir," said the candidate without batting an eyelid. Such tact could not go unrewarded and we passed him by a satisfactory margin, though it seemed to me that he had answered the first question incorrectly. Perhaps he could scarcely be blamed for this, because even the larger textbooks do not mention the fact that if the patella is struck *with the clavicle*, it is the clavicle which breaks.

* * *

The ward round arrived at the bed of the patient with a vesicocolic fistula. "Now," said the chief, turning to Alfred, our student from Nigeria, "tell me what it means when a man makes a whistling noise passing his water."

"It means he is happy, Sir," replied Alfred.

Letters to the Editor

NOTIFICATION OF INFECTIVE HEPATITIS

SIR,—In your issue of Oct. 6 there was a report on the Health Service in 1955 and also an annotation advocating compulsory notification of infective hepatitis. The report stated that the number of donations of blood increased from 700,202 in 1954 to 759,571 in 1955. This increase in the use of blood and blood products must entail an increase in the number of cases of homologous-serum jaundice. May I therefore urge that homologous-serum jaundice as well as infective hepatitis be made notifiable.

At present we have no certain knowledge of how dangerous transfusion of blood and blood products may be, nor are we any nearer to solving the problem of preventing homologous-serum jaundice. Are we, for example, justified in using such an expensive, yet possibly very dangerous, material as plasma in the treatment of oligæmic shock rather than dextran, an effective yet certainly harmless substitute?

It is said that the use of small-pool plasma reduces the incidence of homologous-serum jaundice. Indeed, it has been said [1] that the incidence of jaundice following transfusions of small-pool plasma is only 1·2%, compared with 1·6% following transfusions of whole blood. Such figures are difficult to accept. Each bottle of present-day plasma consists of a pooled mixture collected from eight pints of blood. Each bottle of plasma should therefore carry an eight times greater risk of transmitting jaundice than any single bottle of blood. In actual practice, the risk entailed must be much greater than this. If, for example, a patient with burn injuries required two pints of blood and three litres of plasma, he would in fact receive material from fifty separate blood-donors. Had three litres of dextran been employed instead of plasma, he would receive material from only two donors and he would therefore seem to be twenty-five times less likely to develop homologous-serum jaundice at a later date.

Not until we have full notification of all cases of both infective hepatitis and homologous-serum jaundice (one without the other would be valueless) will it be possible to appreciate fully the danger from transfusion with blood and blood products or to realise how not only money but lives may well be saved by substituting, wherever possible, for these potentially dangerous materials the safe and inexpensive alternatives that are available.

London, N.W.3. S. G. RAINSFORD.

CLINICOSIS

SIR,—I congratulate young Dr. Cobbleigh on achieving his Membership. Soon, I trust, he will find his niche in the hierarchical world of therapeutics, since in the homelier atmosphere of preventive medicine he is an avowed and even belligerent failure.

It has become fashionable to deny the medical officer a place in the sun, and to suggest not only that his talents could be put to a better use but that they may even have atrophied from disuse. We must all be physicians, surgeons, general practitioners. . . . Why? Can it be that physicians and surgeons have a happy knack of confessing their aims in print, while the medical officer tends to turn a deaf ear to the abuse that is hurled at him?

I have used the expression "preventive medicine." I could have written "public health"; but the former seems to bring into sharper focus the difference between medicine as it is practised in a doctor's surgery or out-patient department, and welfare medicine. I would also like to suggest that a busy hospital (where Dr. Cobbleigh was presumably groomed for his M.R.C.P.) is not the best forcing-ground for would-be medical officers. Yet they too have need of special skills, a fact which is recognised by those that recruit them. Some have had previous training in a children's hospital and can offer a D.C.H. as tangible evidence of their eligibility (an achievement not utterly without merit even in the opinion of critical Dr. Cobbleigh). Some have had experience in maternity work. Some, a diploma in public health. A few have even reared children of their own! So, to do our *particular job*, I think we are as well equipped as the average doctor.

What is our job? It is not to treat complicated diseases—no doubt Dr. Cobbleigh did this while he was studying for his M.R.C.P. Courtesy requires us to refer ill children to their private doctor. Our work rather lies in advising inexperienced and often anxious mothers to the best of our ability and with as much understanding of their personal difficulties as we can achieve. (Dr. Cobbleigh is quite wrong in suggesting that the medical officer knows nothing of the mother's circumstances. A conscientious officer is only too anxious to discuss the home background with the health visitor, who can pass on much useful information about the family and living conditions.)

How unlucky Dr. Cobbleigh seems to have been with his toddler clinics! Only three children, and not a blemish among them! I almost find myself sympathising with him. But a toddler clinic which is not in this moribund condition and which maintains a reasonable number of attenders is not the unrewarding experience this one seems to have been. Not all mothers are paragons. Nor are they unteachable. Not a few welcome the opportunity of talking over problems with a qualified person which they would be reluctant to bring to the notice of a general practitioner. A toddler clinic, like an infant clinic, is not the orgy of weighing and measuring Dr. Cobbleigh seems to imagine it to be. It is an opportunity for dispelling some of those erroneous notions foisted on "Mum" by the churchwarden, the chemist, the grocer, and her four neighbours. . . . In short, for inculcating those principles of health education that best seem to suit her need.

Welfare clinics, by and large, are pleasant places, where a woman need not be afraid that her preoccupations, whether trivial or more serious, will not be given a friendly hearing. But she is never "Mum," at least in the clinics which I have attended. Her personality is respected, and she does not merge into the amorphous gel which is all too often the lot of the hospital patient when all that is not strictly pertinent to his ailment is under consideration. "Mum?" Perhaps that is the secret of Dr. Cobbleigh's failure to understand our point of view.

PART-TIME MEDICAL OFFICER.

SIR,—Dr. Cobbleigh's article "Clinicosis" would be extremely funny were it not that so many people, not knowing what does go on in the clinics, will think it true. The author himself, by doing a few locums, has certainly not grasped the essence of welfare work. The mothers who attend the clinic regularly are waiting for their "usual" doctor to return, and he was shown a few selected cases, with which obviously any practitioner could have dealt.

It is surprising that so many mothers still feel the need to attend the clinic, when, according to Dr. Stowell, the advice proves to be no good, and where they cannot even be given a bottle of medicine.

The answer is that the A.M.O.H. normally has a good relationship with her patients, as she has met most members of the family over the years; the woman, perhaps seen before as school leaver, attends the antenatal clinic, and mother and baby are seen at regular intervals. The patient knows that any problem, however small, can be discussed at the clinic—mostly problems with which she would not dare to bother her own doctor, because he is far too busy. The important work of the clinic, apart

1. Squire, J. R., Bull, J. P., Maycock, W.d'A., Ricketts, C. R. Dextran: Its Properties and Use in Medicine. Oxford, 1955.

from recognising incipient disease, lies in health education. The patient is taught the right way of living; she is given confidence in bringing up her children, and many problems caused through the mother's anxiety are prevented.

Dr. Cobbleigh's remarks on infant feeding are irrelevant. There are different schools of thought amongst pædiatricians, most maternity hospitals sending their artificially fed babies out on full-cream National dried milk, and the clinic doctor follows suit. There is of course no competition about weight gain. Any gain from nothing up to a pound may be "normal."

It would make this letter too long to discuss the function of the school doctor; but it is not to refer innocent heart murmurs, of which he hears several during the week.

Given time and interest, a general practitioner can certainly train himself to run his own welfare clinic in the same way as he would take up any other specialty.

But the time has come for the competition between G.P. and clinic to stop. There is no reason why the practitioner who is not interested in pædiatrics or preventive health should not refer his patients to the clinic as he would refer them to a hospital outpatient department. As a child is brought up by both parents, the father (the G.P.) dealing with the major problems of life, the mother (the A.M.O.H.) with the humdrum affairs of daily life, so can the patient benefit from both doctors. But if the parents quarrel, it is the child who is the loser.

A.M.O.H.
(and not ashamed of it).

SIR,—This is one of the best articles I have read for a long time and so true and so important. We should thank this young doctor for his sound criticism and his courage.

I tell all my mothers that they must make up their minds: either the children are looked after by their own doctor—who is available every day and night—or they take them to an office at certain hours which can give no assistance in an emergency or in the evenings or at weekends.

FAMILY DOCTOR.

SIR,—Happy as I am to congratulate R. Cobbleigh on his success with the Censors, I cannot extend the same sentiment to his criticism of the local-authority health service which he miscalls "the welfare service." Few readers of *The Lancet* will take seriously remarks designed to ridicule the work of doctors in this field and to affect adversely the relationship between the general practitioner and the clinic doctor, but I feel that they cannot pass without some comment.

He admits that he knows little of the school or antenatal or postnatal clinics; but I am surprised to learn that Cousin George, with his ten years' experience of general practice, has such a poor opinion of the former. Now that cardiac surgery has so much to offer, I thought even George would agree that any cardiac abnormality in a child should be investigated. Since he appears to be as obtuse as his cousin, he would not be expected to appreciate the work done by school doctors in detecting and dealing with defects unnoticed by the parents and thus never referred to the family doctor, or the detailed knowledge needed to secure the correct school placement of the physically and mentally handicapped children.

The perusal of the annual report of any school medical officer would, no doubt, give George and Richard some food for thought, besides adding to their education.

Richard's remarks on infant welfare are witty but a little confused. If he finds so many Mums are overfeeding and generally mismanaging their infants, in spite of multifarious advice from all and sundry, can he not see the value of regular attendance at, and advice from, one doctor's clinic? He must be inexperienced indeed, in spite of his M.R.C.P., if he does not appreciate the value to the anxious young mother of reassuring advice given after a careful examination of a perfectly normal baby. The penultimate paragraph expresses some really extraordinary ideas. Does Richard really think that a waiting-room crowded with sick adults is a good place for a baby, or that immunisation does not matter? If he does I no longer wonder at his remarks but rather at the Censors' decision in his case.

London, E.4. GEOFFREY POOLE.

SIR,—Richard Cobbleigh must be congratulated on obtaining his M.R.C.P., especially as he confesses to deceiving the Censors. I agree wholeheartedly, he did deceive them.

He is ignorant of the functions of the welfare centre, as is fully apparent from the context of his letter to Uncle Tom, yet he criticises it; much as another callow youth on being given a violin for the first time, after hearing the dreadful noise when he scraped the bow across the strings, declared the violin to be an inadequate instrument.

He is appalled that the Welfare Mum does not consider that overfeeding exists, in which she agrees of course with many modern pædiatricians. I am most impressed to note that Richard has been reading modern literature on lipoproteins and fat intake, but would like to inform him, as he has apparently missed the point in his deep studies, that coronary disease, which is the suggested dangerous complication of errors of lipid metabolism, is not generally considered to be a hazard of the small infant. It is, I assure him, quite unnecessary for him to praise obese infants and commiserate over normal children. Any such foolish propaganda was long since discontinued, if it ever happened, in welfare clinics.

He is mighty proud of his M.R.C.P., but uses his recently acquired erudition to heap scorn on an "elderly and amiable" health visitor, who has no opportunity of giving her version of a conversation with Richard Cobbleigh, M.R.C.P.

I agree that the best general practitioner is the best infant-welfare-centre doctor, but can assure Dr. Cobbleigh that if local authorities did not carry out this work it would cease for 90% of the population.

Uncle Tom Cobbleigh and all his friends are strangely lucky in their easy access to *The Lancet* although they are pompous, prejudiced, often ignorant, and naïve. The rest of the medical profession must queue up for admission to your much-sought-after columns, and their signed articles must be valued on their merit, which is, of course, as it should be.

Ilford. I. GORDON.

HEADACHE AFTER SPINAL ANÆSTHESIA

SIR,—Headache after spinal anæsthesia can be very distressing and debilitating and may last for a considerable time. Your annotation of Sept. 22 reminded me of a simple method, which I used personally and which gave me immediate and permanent relief.

Ten years ago, under spinal anæsthesia, I had an operation for acute appendicitis. There were no postoperative complications except severe headache, nausea, and anorexia, which failed to respond to any treatment.

After eight days of continuous headache I discovered accidentally one morning that when firm pressure was exerted with the palm of the hand on the occipital region the headache became less intense and gradually disappeared. When the pressure was released the headache recurred. I found it too tiring and inconvenient to keep on pressing on the occiput; so I asked for a sphygmomanometer cuff and I applied it round the occiput and forehead with the inflatable bag over the occiput. I closed the open connection with an artery forceps and pumped up the bag until I felt that headache

had disappeared. I left it on for over three hours, keeping up the pressure all the time, and when I finally removed it I had no more headache and it did not recur. I began to get up and left the hospital after four days free from any symptoms.

My explanation of the benefit is this:

A rise in venous pressure hinders the absorption of the cerebrospinal fluid and raises its pressure. By exerting pressure on the occipital region, the occipital veins are compressed. These veins are connected with the superior sagittal sinus through the parietal emissary vein and with the transverse sinus through the mastoid emissary vein.[1] The occipital pressure causes a rise in the venous pressure in the sinuses, and the absorption of C.S.F. is delayed and its pressure is increased. If the occipital compression is prolonged and continuous, the intracranial dynamics are so altered, that the C.S.F. pressure is stabilised at a higher level than before, in spite of the small leak through the perforation of the spinal dura.

This supports your view that the headache following spinal anæsthesia is due to a low C.S.F. pressure.

This method of relieving the headache is simple, effective, and free from any dangers as it does not involve the use of any drugs or intrathecal injections of solutions which may cause still more spinal-dura perforations.

London, S.E.25. A. FRY.

WALKING-AIDS

SIR,—The description by Mr. Hendry (Oct. 20) of "a compact and easily controlled new walking-aid" begins with the statement that walking-aids have an established place both in short-term rehabilitation and in keeping ambulant patients with a permanent locomotor defect. This is undoubtedly true. Yet walking-aids are often recommended for children with infantile cerebral palsy. Since the management of these children is certainly not "short-term rehabilitation," and since the infantile cerebral palsies are no longer looked upon as "permanent locomotor defects," it seems worth while to examine whether there is any rationale for the use of walking-aids in these conditions. No walking-aid is required for a child whose unaided gait is good. At the other extreme, the helpless child cannot operate such an appliance. The problem thus relates only to children whose capabilities fall between these extremes.

The practice of encouraging a child who is unable to propel himself except in a grossly abnormal way, to use, unsupervised, a walking-aid will be universally condemned, since it perpetuates as habits grotesque postures and movements. Relieving the burden on "staff"—particularly when they are employed especially for the care of these children—is no reason for adopting such a harmful expedient. But if the child who uses the walking-aid is *unable* to attain the normal postures and movements of walking, no amount of supervision will make these possible for the child at that time, and the use of the aid must involve the risk of the establishment of abnormal posture and movement.

There remains the child who, under supervision, can attain a gait which is normal in appearance. Even here it must be remembered that locomotion with a walking-aid is not normal walking but only supported self-propulsion; satisfaction with this on the part of the child and of those caring for him must delay rather than speed the attainment of stability of gait independent of support. Doubtless there are fields in which the new walking-aid has logical applications, but the management of children with cerebral palsy is not one of these.

The child with cerebral palsy is a child in whom voluntary movement has been prevented from developing normally by reason of neurological defect. The ideal for him is that he should be so aided from the inception of voluntary movement that when he reaches the stage at which walking becomes possible for him he has already acquired the requisite activity to perform this normally. If he has not been so aided and has developed a defective gait, we do him no service if we encourage him to make this habitual. Instead, we must help him to acquire those capabilities which are the basis on which the normal gait is founded.

1. Gray's Anatomy. 13th ed., London; p. 820.

Cerebral Palsy Unit, Queen Mary's Hospital for Children, Carshalton. EIRENE COLLIS.

Charing Cross Hospital, London, W.C.2. WILLIAM DUNHAM.

DENTISTRY

SIR,—The report of the Committee on Recruitment to the Dental Profession, which you reviewed on Oct. 13, will be welcomed by many concerned with dental education and practice as a valuable contribution towards the solution of a problem of great public importance. It is, however, regrettable that a little more space was not devoted in the report to the various steps taken to raise dentistry from a trade to a profession in the 19th century. Undue compression is probably responsible for statements (Appendix VIII, p. 60) that are misleading if not quite contrary to fact.

Without minimising in any way the enormous influence exerted by Sir John Tomes, it would be unjust and historically quite untrue to neglect the contributions of his colleagues. Among the most prominent of these were Sir Edwin Saunders, W. A. Harrison, and T. A. Rogers, all of whom played quite as great a part as Tomes in the foundation and management of the Odontological Society, and the Dental Hospital of London. Saunders in particular must be regarded as the "Father" of the Dental Hospital of London, and in the sphere of professional organisation and educational work his importance is not less than that of Tomes.

The Dental Hospital of London (now the Royal Dental Hospital *not* the National Dental Hospital) owed its foundation in 1858 to the Odontological Society, one of the original aims of which was to establish a dental hospital *and school*. The Dental Hospital of London opened on Dec. 1, 1858, and the London School of Dental Surgery on Oct. 1, 1859.

The National Dental Hospital and School (now University College Hospital Dental School) was not opened until Nov. 11, 1861. It arose out of the Metropolitan School of Dental Science (founded Oct. 5, 1859), which was in turn the protegé of the short-lived College of Dentists in England (founded Feb. 14, 1857). The College of Dentists in England represented one of the two rival groups working towards dental reform in the middle of the 19th century, the other being the Odontological Society. In 1863 the College of Dentists, lacking sustained support, amalgamated with the Odontological Society.

If any institution can be regarded as the true precursor of the Dental Hospital of London, it is the London Institution for Diseases of the Teeth, founded by Edwin Saunders, W. A. Harrison, and James Snell in 1840. The history of this institution is obscure, but it lasted for about twelve years and there is definite evidence that it received pupils.[1] A London Dental Dispensary, established in Clarence Gardens, Regent's Park, in 1855 by Charles James Fox, did good work for some years, but there is no evidence that it served in any way as a teaching centre.

There is no doubt whatever that the first dental *hospital* (as distinct from small and short-lived dispensaries) was the Dental Hospital of London and that the first dental *school* with a regular curriculum, and full facilities for clinical instruction was the London School of Dental Surgery. These two institutions are now represented by the Royal Dental Hospital and School of Dental Surgery (University of London), the hospital being one of the constituent hospitals of the St. George's Hospital Board and the school being a school of the University of London.

One other point which I might mention here: in Appendix III of the report, the number of students shown as qualifying in the year 1953–54 from the Royal Dental Hospital is given as "Nil," whereas in fact the number was 62, comprising 61 L.D.S., of whom 15 also graduated

1. *Forceps*, July 27, 1844, p. 149.

B.D.S., and 1 graduated B.D.S. These figures of degrees and diplomas are available in the returns of the University Grants Committee.

School of Dental Surgery,
Royal Dental Hospital of London,
Leicester Square, W.C.2.

C. BOWDLER HENRY
Chairman, School Council.

THE GREATER MEDICAL PROFESSION

SIR,—Dr. Fox (Oct. 13) likens the auxiliary professions to members of a Commonwealth in different stages of political development. Some, such as the physiotherapists, he says, are unquestionably Colonies; others, and he instances almoners, are not prepared to be Colonies but junior members; while dentists have as much self-government as India.

The analogy is attractive, but misleading because the position of the doctor is obscure. Indeed, Dr. Fox adds to the obscurity by abandoning his analogy in favour of installing the doctor as "the chairman of the committee of experts that decides what is to be done." This implies that the committee decides and would therefore assume responsibility for whatever is done for (and to) the patient, although Dr. Fox had previously made it clear that it is the doctor who retains responsibility. Which is it to be? The confusion can only lead to empire-building by the auxiliaries.

I believe that no confusion need arise if we are clear as to how we stand to each other in regard to our functions, skills, disciplines, and ethics, and if we are also clear as to the chain of command. The hospital has one main function—the treatment of patients. Some departments—the treatment departments—make a direct contribution to treatment, while the service departments provide the house-keeping service as an indirect contribution to treatment. The medical staff control and are responsible for treatment, in the course of which they will order the treatment departments to render their contributions. The control of the house-keeping departments is a lay function. Each medical, surgical, or dental firm is an autonomous treatment unit, and each will vary in the demands it makes upon the treatment departments according to the kinds of treatment it offers and to its own ideas and ideals. Every medical auxiliary (and I am using this term to include every non-medical person contributing to treatment) is under the authority of the medical staff to make his contribution when so ordered. This will apply to biochemists, physicists, pharmacists, almoners, and physiotherapists, as none may exercise his or her function of treatment without receiving an order to do so. It must be emphasised that there is no loss of dignity or status in being under orders, providing that the order applies to the end-result or product and not to the methods involved.

A pharmaceutical example will serve as an illustration. A physician gives an order in writing (a prescription) to a pharmacist for an intravenous injection of a thermolabile drug. The route of administration indicates that a sterile solution is required. The physician may have views on whether or not the solution should be isotonic and/or buffered; if he has, he can demand that it shall be formulated accordingly. But providing that the presentation of the drug satisfies his criteria of "fitness" to produce the required therapeutic effect, he need have no knowledge of the chemical or physical properties of the drug, neither is he concerned with how it shall be prepared or sterilised.

Similar principles apply to orders to other auxiliaries, although in some instances a particular technique may be prescribed to obtain a particular or a more satisfactory end-result. If this principle is understood and accepted there would be no case for empire-building; we should all be working as a team with the interests of the patient as the focus of our contributions. An almoner, for example, cannot be independent and remain a member of the team. Can she claim that she is not working under orders; that her findings and advice are not at the disposal of the prescriber to accept or reject according to his over-all assessment of the patient? Does she claim a dichotomy of function, with the doctor in control of the clinical diagnosis and treatment, and the almoner in control of the diagnosis and treatment of the social conditions of the patient? In the interest of the patient is such a division of control possible or desirable, and is the medical profession prepared to accept divided responsibility? The answers to these questions may well decide the future status of medicine and of the auxiliary professions. If by default or design the doctor is unable or unwilling to retain the will to command, he may become the "chairman" and like a chairman he may have a casting vote and little else. And for the lesser professions anarchy will result.

The Churchill Hospital,
Oxford.

W. TRILLWOOD
Director of Pharmaceutical Services.

RENAL INFARCTION WITH HYPERTENSION

SIR,—I appreciate Dr. Rosch's comments (Oct. 6) on the article by Dr. Hunter and myself (Sept. 1). May I point out, however, that this was a report of what we thought was an interesting case and, consequently, called for no references. No comments were made on the frequency of the condition, and there was nothing in the report that should leave the impression that this was a unique experience.

Victoria, B.C.,
Canada.

W. A. MCELMOYLE.

OMISSION OF PRESCRIBED P.A.S.

SIR,—We were interested and alarmed by the letter from Dr. Gordon (Oct. 13).

In place of isoniazid with *p*-aminosalicylic acid (P.A.S.) in the treatment of pulmonary tuberculosis, he suggests the use of 'Dipasic' alone. Each tablet of this preparation contains 100 mg. of isonicotinic acid hydrazide-*p*-aminosalicylate. The manufacturers advise an average daily dose of one tablet per 20 lb. body-weight. A 10-stone man would thus receive 700 mg. daily, which is roughly equivalent to 350 mg. each of isoniazid and P.A.S. if these were given separately. By generally accepted standards this dose of P.A.S. is quite inadequate to prevent the emergence of bacterial strains resistant to isoniazid.[1] Thus, if one considers dipasic as P.A.S.+isoniazid, there is theoretically a grave risk of developing resistance to isoniazid if the drug is given alone. On the other hand, if it is considered as a single chemical compound, to give it alone is also contrary to the accepted principles of treatment for pulmonary tuberculosis with antibiotics. It seems to us therefore an unwise procedure to use this drug alone until very much more extensive and fully valid trials are available to confirm (*a*) its efficacy and (*b*) its capacity to prevent the emergence of resistant strains.

We fully appreciate the danger of giving separate tablets of isoniazid with one of the many preparations of P.A.S. The risk of the patient not taking P.A.S. but continuing to consume isoniazid is much higher than is usually thought.[2] This problem can be partially surmounted by giving one of the many proprietary preparations, now available in cachet or powder form, which contain adequate doses of both isoniazid and P.A.S. (e.g., 'Pycamisan' or 'B-Pasinah'). If the patient fails to take these, which may upset him in the same way as P.A.S. alone, then he fails to take both drugs and does not take one without the other.

If it is felt that a more careful check should be kept upon the patient, there are now available simple routine urine tests which indicate the presence or absence of

1. Medical Research Council Trial. *Brit. med. J.* 1953, ii, 1005.
2. Simpson, McD. *Tubercle, Lond.* 1956. 37, 333.

P.A.S.[2] It is of course important in this respect to hide from the patient the significance of the urine test, which could be completely invalidated by taking one dose of P.A.S. on the morning of attending the clinic.

W. M. DIXON
Hammersmith Chest Clinic. PETER STRADLING.

EFFECT OF UNABSORBED RADIOGRAPHIC CONTRAST MEDIA ON THE CENTRAL NERVOUS SYSTEM

SIR,—We have read Mr. Davies's article (Oct. 13) with some concern. The figures he gives for abnormal reactions —especially those immediately following the examination—appear extraordinarily high. Indeed with 70 "abnormal" reactions in a series of 125 cases one might ask, what is the normal?

Lumbar puncture itself is not an entirely harmless procedure, and it would be interesting to know what proportion of his cases have symptoms following lumbar puncture alone—i.e., without insertion of 'Myodil.' His findings would be more convincing if clinical details of individual cases were given. For example, it would be helpful to have more detail of his 5 cases that came to operation—4 of them for the second time. It must also be agreed that in the long-term follow-up of the cases it is difficult to be sure that new symptoms are not due to the original disease rather than to the myodil.

In our own experience, in this area and elsewhere, there have been few, *if any*, noticeable reactions from the injection of myodil, by lumbar or cisternal route; and in the long-term follow-up no definite sequela has yet come to light. We agree that myelography should not be undertaken lightly, and that occasional cases of complication are on record; but in our experience the picture is far from being as gloomy as Mr. Davies finds it.

An issue of such obvious importance, both in its clinical and in its medicolegal aspects, deserves the closest attention.

Department of Neurological Surgery, Frenchay Hospital, Bristol. D. G. PHILLIPS
J. L. G. THOMSON.

THE RÔLE OF THE PÆDIATRICIAN

SIR,—In his Harveian Oration, as reproduced in your last issue, Professor Crighton Bramwell is obviously unhappy about the development of pædiatrics when he writes:

"Likewise it is only in comparatively recent years that pædiatrics has split off from general medicine. All would agree that the care of infants and young children calls for special knowledge, for infants are uncoöperative and inarticulate; but there are many who doubt the wisdom of a child with rheumatic heart-disease being under the care of a pædiatrician up to the age of puberty and then, at that critical epoch, suddenly handed over to another specialist. Such discontinuity in management is surely undesirable. It is the disease, not the age, that matters."

His reference to the pædiatrician suggests a very narrow type of specialist who has little contact with other colleagues, though in fact the pædiatrician has a wider contact with other specialists and with general practitioners than most consultants.

The child with rheumatic heart-disease who is suddenly transferred to another specialist at puberty conjures up a very false picture and ignores the rôle of the family doctor. If the child was sufficiently ill to be in hospital, he would most certainly remain under the same specialist, though many pædiatricians would have already called in the help of a cardiologist in the severe type of case to which Professor Bramwell seems to be referring. On the other hand, if, as seems more likely, the child is at home, the connecting link is the family doctor and there is no question of "discontinuity in management" when the pædiatrician leaves the field.

Professor Bramwell grants us that "the care of infants and young children calls for special knowledge" but for the reason that "infants are uncoöperative and inarticulate." This suggests that Professor Bramwell thinks of the pædiatrician as an interpreter of infantile noises and makes no reference to the many diseases which are confined to this age-group and to those others which, though common to adults, behave in a different fashion.

Plymouth. HUGH JOLLY.

INFANTILE HYPERCALCÆMIA

SIR,—I hope Dr. Evans will allow me to correct an error of logic and an error of chemistry in his letter of Oct. 13. He states that calciferol is erroneously referred to as vitamin D and that this terminological laxity has pervaded our scientific literature. The alleged lax error is to be found in his own writings[1]: "The exact identity of the vitamin D in margarine is not ascertainable." (Incidentally, since the chemical substance is added, its identity is obviously ascertainable.) This shows the correct use of the term "vitamin D" as a generic term embracing all substances similar in chemical constitution and physiological action.

Dr. Evans complains that calciferol (vitamin D_2) is not a physiological substance, that a non-physiological substance cannot be physiologically necessary, and that no two dissimilar substances can possibly have identical biological effects. The last of these claims would appear to be wrong: oral administration of pyridoxal or pyridoxine, two forms of vitamin B_6, could have identical biological effects in man and so far I believe no differences in such effects are known. I do not understand what he means by a physiological substance. A hen fed irradiated ergosterol has vitamin D_2 in its egg, whereas if fed cod-liver oil it has vitamin D_3 ("'animal' vitamin D" in Dr. Evans's nomenclature). Either type of egg can protect a child from rickets. Irradiated ergosterol does not seem to be any less physiological as a dietary constituent for the hen than cod-liver oil (some fish-liver oils contain vitamin D_2 and a form of vitamin D more active for the chick than vitamin D_3; ergosterol represents most of the sterol of yeasts, and about 4% of the sterols of human skin where it presumably gets irradiated).

There are certainly differences in physiological potency and possibly in action between vitamin D_2 and vitamin D_3, and there may be a more active natural form for man (as there appears to be for the chick) than vitamin D_3, but we need more research to elucidate such differences. Let us continue to use the term vitamin D as in the Statutory Order that Dr. Evans criticises.

Dr. Evans states: "Vitamin E, as dl-α-tocopheryl acetate [which being a synthetic chemical and not a naturally occurring 'physiological' substance should not in Dr. Evans's nomenclature be regarded as a vitamin E], however, I constantly use to great advantage in the most severely ill patients of all ages"; and he then generously states that I seem to have reached similar conclusions to his in my letter of July 14. The deficiency of vitamin E, he claims, leads to oxidation products in foods "which include the oxidised (hydrogenated) and comparatively useless forms of the essential unsaturated fatty acids in processed milk, butter and margarine." It is true that in my letters of April 7 and July 14 I discussed isomeric forms, hydrogenation, and oxidation of essential fatty acids (E.F.A.), but I did not commit the elementary chemical error of regarding hydrogenation as oxidation (it is, of course, reduction). May I make my contention quite clear? Cow's milk and butter contain no or almost no "ordinary" linoleic acid (the *cis-cis* isomer) but do contain an isomeric form (the *cis-trans* isomer) which not only does not act as E.F.A. but is actually antagonistic in lower animals. Cow's milk or butter is a very poor source of E.F.A. whereas breast-milk is a very good source, and this has recently been beautifully demonstrated at the International Paediatric Conference by

1. Evans, D. M. *Practitioner*, 1948, **160**, 306.

Dr. Arild Hansen on infants: the inefficiency of cow's milk can be demonstrated as early as about three days after transference from the breast to cow's milk, and this inefficiency can be overcome by supplementing cow's milk with vegetable oils containing E.F.A. Cow's milk is not the "perfect food" it is so often alleged to be, and it and butter may contribute even more than margarine (in which some but not all E.F.A. is destroyed and isomeric forms are produced) to E.F.A. deficiency, and hence I believe to coronary thrombosis. National dried whole-cream milk, as supplied direct from the Ministry of Food, has a lower content of highly unsaturated fatty acids than milk supplied on my doorstep; but I have not analysed the same milk before and after roller-drying. This dried milk rapidly loses unsaturated fatty acids by oxidation with formation of peroxides, and later the typical off-flavour is produced owing to aldehyde formation. The longer it is stored in air, the greater the loss of E.F.A., which might be relevant to the geographical distribution of hypercalcæmia. The infant can hardly be expected to object (except by anorexia or vomiting) to these peroxides, which are strong oxidising agents and oxidise further E.F.A. It is because I thought infants fed on National dried whole-cream milk would be likely to be deficient in E.F.A., and because I thought this deficiency would interfere with the proper metabolism of vitamin D as of cholesterol that I gave a dosage of vitamin D to E.F.A.-deficient rats that was not toxic to controls even in double the amount; the deficient rats developed hypercalcæmia and died of nephrocalcinosis.

I therefore strongly endorse Prof. A. C. Frazer's powerful plea (July 28, p. 197) for more (or is it some?) fundamental research on human nutrition in this country. Our welfare foods policy is a perfect example of this deficiency. I yield to none in my admiration of Sir Wilson Jameson's introduction of welfare foods in 1941 and of Sir Jack Drummond's implementation of this enlightened policy. But surely the basic information should have been available on which to establish this policy, and research should have been done into the advantages and disadvantages to children. Such research would have cost an insignificant fraction of the total cost of the welfare foods scheme. A few years earlier, Sir Edward Mellanby had implied in your columns (Sept. 5, 1936, p. 600) that the Medical Research Council had no shortage of funds; he was replying to a letter of mine (Aug. 15, p. 404) which was pseudonymous because my name then as now was unimportant. Then the M.R.C. was spending about £165,000 annually and now the figure is £2,086,000, and still the requisite research is not done. For instance, Professor Frazer writes that cod-liver oil provides vitamin D in association with unsaturated fatty acids. But unfortunately cod-liver oil contains no ordinary linoleic acid (*cis-cis*) and its toxicity may be related to this. Further, welfare orange-juice contains citral, which Leach and Lloyd [2] have shown to be toxic to lower animals; Dr. Evans himself wrote that breast-fed infants suffering from "intestinal disorders were adversely affected by the taking of marmalade by the mother," and the citral in marmalade might pass into breast milk. So our welfare foods—National dried full-cream milk, orange-juice, and cod-liver oil—are suspect; yet no research seems to be done. If they were welfare fodder for horses or cattle there would be intensive research. We have the interesting contrast of babies in undeveloped countries being weaned on to carbohydrate foods rich in E.F.A. but low in protein so that kwashiorkor results, whereas babies in the more highly civilised countries are given welfare foods rich in protein but deficient in E.F.A. so that the seeds are sown of the disorders I have mentioned in my earlier two letters to you.

Oxford. H. M. SINCLAIR.

2. Leach, E. H., Lloyd, J. P. F. *Proc. Nutrit. Soc.* 1956, **15**, xv.

BURNS AND SCALDS

SIR,—There is no one method of treating all burns under all conditions, but the aim of methods likely to be successful is surely to obtain a dry surface to the burned area. It is timely that Professor Wells, in his letter of Sept. 15, should direct attention to the value of exposure methods where applicable towards this end.

Following the teaching of Mr. A. B. Wallace for two years in this country, thereafter, from 1950 to 1953, exposure treatment was regularly used in the management of large numbers of burns in the Canal Zone, with the same good results indicated by Professor Wardill in his letter of July 14. Many were the military medical practitioners who would be willing to testify conversion to exposure methods of treating burns in this part of the world at this time, by seeing for themselves and believing. Not even the notorious sand-storms of the desert could interfere with healing under a dry exposed surface.

I trust that Professor Wells may find the same uniformly good results with this method in his trials, as we have found in many military hospitals in this country and abroad, and I venture to suggest that for many, this chapter in the story of the treatment of burns has already been written, but that it cannot be rewritten too often, lest any remain unaware of the place held by exposure in the management of burns.

Royal Army Medical College, London, S.W.1. A. G. D. WHYTE Consultant surgeon.

CALORIE INTAKE IN RELATION TO BODY-WEIGHT CHANGES

SIR,—The relation of caloric intake to body-weight changes certainly is not so simple as is presumed in the current reducing diets. It seems to be a fact, even if not understood so far, that there really exist lean big-eaters and fat poor-eaters. Nor is the basal metabolic rate decisive: low values may be connected with cachexia, Graves's disease with obesity.

The investigations of Professor Kekwick and Dr. Pawan (July 28), which suggest some factor operative in weight reduction other than mere caloric restriction, are therefore of great theoretical consequence. But I could not find in their paper any remark about the hunger of the patients, or about the satisfying value of the different diets. It would not be of much practical importance if, for instance, the relatively high caloric value of a pure fat diet could nevertheless reduce the weight of some obese person, as long as those many calories would not satisfy his hunger.

Continuation of these interesting experiments, but at the same time registering the different subjective reactions of the patients, would be very welcome indeed.

Tel Aviv, Israel. T. LEVY-ZAKS.

SIR,—Dr. Pawan in his comment (Oct. 13) on my letter (Sept. 29) summarises the various conditions under which greater increases in body-weight have been observed to occur on high-fat diets than on isocaloric high-carbohydrate diets. He then goes on to state that mice with the hereditary obesity-diabetes syndrome show the opposite response—i.e., the same as that reported by Kekwick and Pawan [1] in short-term experiments in human beings. However, in the experiments referred to,[2 3] food intake was not reported. All that we are told is that two mice suffering from this interesting hereditary metabolic abnormality got very sick and lost weight when they were put on a high-fat diet.

Dr. Pawan writes that "comparison of the effects of diet in different animal species and man over varying periods of time must, of course, require cautious inter-

1. Kekwick, A., Pawan, L. G. S. *Lancet*, July 28, 1956, p. 155.
2. Mayer, J., Jones, A. K., *Amer. J. Physiol.* 1953, **175**, 339.
3. Mayer, J., Russell, R. E., Bates, M. W., Dickie, M. M. *Metabolism*, 1953, **2**, 9.

pretation "—which is true. But these two mice do not require any interpretation at all. They carry no evidence about the relation between caloric intake and body-weight changes.

Second University Clinic of Internal Medicine, Kommunehospitalet, Aarhus. KNUD LUNDBÆK.

MYOPATHY IN SHEEP

SIR,—We have read with great interest the article by Dr. Bosanquet, Dr. Daniel, and Mr. Parry (Oct. 13) on myopathy. During our investigations of myopathy in cattle in N. Scotland we encountered and have recorded muscular degeneration in adults in three flocks of sheep.[1] Dodd in New Zealand has described a similar disease in adult sheep.[2] In our cases, judged by pathological, histological, and biochemical criteria, the lesion was identical with that seen in experimental muscular dystrophy in the calf,[3] and in the naturally occurring disease of beef cattle which we have called "enzoötic muscular dystrophy."[4]

These two myopathies of cattle are of considerable interest since they also appear comparable in almost all respects to the disease reported by Dr. Bosanquet and her associates. The diversity of clinical signs, attributable to differences in the degree to which individual muscles are affected, was recognised in our early studies,[3] and we have usually classified the types of the disease into skeletal, cardiac, and diaphragmatic types. The disease in the skeletal musculature is bilaterally symmetrical and there is no evidence from clinical or histopathological study that there is a neural involvement.[5] Histologically the sequence of degeneration in the experimental disease consists of hyaline degeneration of the muscle cell, followed by collapse of the sarcolemmal tube and proliferation of the sarcolemmal nuclei.[6] As in the sheep disease, the lesion is primarily non-inflammatory, and one is struck by the fact that a single cell is usually affected throughout the whole of the length covered by a longitudinal section, whereas its neighbouring fibres may appear normal. We have only rarely seen replacement of the degenerate fibre by fatty tissue or by collagen, though chemical analysis does reveal an increase in collagen, lipid, nucleic acid, and sodium content, together with a fall in myosin, potassium, creatine-phosphate, myoglobin, and adenosine triphosphate, suggesting that œdema fluid, collagen, and fat, as well as the sarcolemmal nuclei, replace the degenerate myoglobulins.[7] It is thought that the absence of fatty or fibrous-tissue replacement reflects the fact that the animals are predominantly young with a considerable capacity for further muscle growth. In the adult the capacity for regeneration is clearly limited.

Both the experimental disease and the enzoötic disease can be prevented by vitamin-E therapy, but they cannot always be cured by giving vitamin E to affected stock, particularly if the disease is of long standing. The experimental disease occurs when unsaturated fats such as lard [3] or small amounts of cod-liver oil [5] are given, and in the case of cod-liver oil it is referrable to the toxicity of a polyethenoid fatty-acid fraction.[8] 50 mg. α-tocopherol acetate prevented the disease when the lard was the source of fat, but 200 mg. had to be given to prevent when the diet contained cod-liver oil.[5] The enzoötic disease with an incidence in some areas of 25% is not associated with dietary excesses of polyethenoid acids or with excesses of such acids in the blood, but is always associated with a low tocopherol content of the diet of the mother and offspring.[9] Such diets are of turnips, straw, or limited hay, and small amounts of concentrates.[4] Extensive experimentation on over forty farms in N. Scotland has shown that the disease can be prevented by giving 20 mg. or 150 mg. α-tocopherol acetate to the calf each day until it receives an adequate intake of the vitamin from pasture. 10 mg. α-tocopherol acetate was only partly effective, some mild cases appearing in the treated group of 78 animals.[10] Increasing the tocopherol reserves of the calf at birth by increasing the tocopherol intake of the dam before calving is also an effective method of preventing the disease.[11] At the present time, prophylactic therapy with vitamin E has become common farm practice in the area involved, and judged by abattoir statistics the disease is now (1956) under control.

We have emphasised elsewhere [12] the fact that the histological sequence of muscular degeneration is not necessarily pathognomonic of a dietary deficiency of tocopherol. Indeed, we have produced comparable muscular abnormalities in a variety of ways, and such studies show that muscle tissue has but a limited range of reaction to a variety of "metabolic injuries." We do think, however, that the *prophylactic* use of tocopherol in the sheep disease described by Dr. Bosanquet and her colleagues merits trial for the following reasons. Firstly, the diets of the sheep appear comparable to those used on cattle farms in N. Scotland experiencing enzoötic muscular dystrophy, the disease which is prevented by α-tocopherol therapy. Secondly, the treatment of affected cases in our flocks of sheep using α-tocopherol acetate by mouth appeared to be effective.[1] These cases were clearly more acute than those described by Bosanquet et al. Lastly, in the single instance in which Dr. Bosanquet and her colleagues employed α-tocopherol acetate therapy, the vitamin was given by injection. We have shown that this ester of α-tocopherol is not readily absorbed from injection sites, and in prophylactic experiments is not very effective in preventing muscular degeneration, although comparable quantities given by mouth are completely effective.[13]

Finally, we have coloured cinematograph records of clinical and pathological aspects of the muscular disease in our sheep, together with more extensive cinematograph records of the enzoötic disease in cattle. These may well enable us to find whether the disease we have described in sheep is or is not identical with one or other of the types now described by Dr. Bosanquet and her colleagues, and also enable a direct comparison with the cattle disease to be made.

The Hannah Dairy Research Institute, Kirkhill, Ayr, Scotland. K. L. BLAXTER.
Royal Hospital for Sick Children, Yorkhill, Glasgow, C.3. A. M. MACDONALD.

SIR,—In their interesting and valuable article Dr. Bosanquet and her colleagues state, in the discussion of vacuolation of neurones in the brain-stem of sheep affected with scrapie, that "Some workers (Brownlee 1940, Holman and Pattison 1943) have suggested that these vacuoles are pathognomonic of scrapie . . ." In fact what we said was exactly the opposite. Our words were: "The finding of vacuolated cells, therefore, cannot be accepted as pathognomonic of the disease . . ." We

1. Graham Marr, T., Sharman, G. A. M., Blaxter, K. L. *Vet. Rec.* 1956, **68**, 408.
2. Dodd, D. C. *N.Z. J. Agric.* 1954, **89**, 369.
3. Blaxter, K. L., Wood, W. A. *Brit. J. Nutr.* 1952, **6**, 144.
4. Sharman, G. A. M. *Vet. Rec.* 1954, **66**, 275. Blaxter, K. L. *Ibid*, 1953, **65**, 835.
5. Blaxter, K. L., Wood, W. A., MacDonald, A. M. *Brit. J. Nutr.* 1953, **7**, 34.
6. MacDonald, A. M., Blaxter, K. L., Watts, P. S., Wood, W. A. *Ibid*, 1952, **6**, 164.
7. Blaxter, K. L., Wood, W. A. *Ibid*, p. 144.
8. Blaxter, K. L., Brown, F., MacDonald, A. M. *Ibid*, 1953, **7**, 187.
9. Garton, G. A., Duncan, W. R. H., Blaxter, K. L., McGill, R. F., Sharman, G. A. M., Hutcheson, M. K. *Nature, Lond.* 1956, **177**, 792.
10. Blaxter, K. L., Sharman, G. A. M. *Ibid*, 1953, **172**, 1006.
11. Blaxter, K. L., McGill, R. F. *Vet. Rec. & Annot.* 1955, **1**, 91.
12. Blaxter, K. L. The myopathies of cattle, sheep and horses. *Vitamina E. Atti del Terzo Congresso Internazionale, Venezia*, 1956, p. 622.
13. Blaxter, K. L., Brown, F., Wood, W. A., MacDonald, A. M. *Brit. J. Nutr.* 1953, **7**, 337.

were aware that similar vacuolated cells are sometimes found in sheep not showing clinical evidence of scrapie, and sometimes also in clinically healthy sheep.

Our paper recorded an association between the presence of vacuolated cells in sections of the medulla oblongata and the occurrence of clinical symptoms of scrapie that gave a coefficient of association in which chi-squared was 155, and p less than 0·0001. Had we felt that hypotheses would add to our knowledge of the disease, we might have suggested that vacuolation was a secondary change following infection, and we feel that on the evidence so far presented by Bosanquet et al. this qualification might also be applied to myopathy.

With regard to your contributors' views on the experimental transmissibility of scrapie, and on the losses attributable to this disease (the latter mentioned in your editorial) we know that there are persons better qualified than we are to comment in detail. We hope they will express their opinions, because such statements ought not to pass unchallenged.

Agricultural Research Council Field Station, Compton, near Newbury, Berks.

H. H. HOLMAN
I. H. PATTISON.

INTEGRATED GYNECOLOGY

SIR,—In your review (July 21) of our book, your objection to the enumeration of the manifestations of genital infantilism is contrary to the generally acknowledged experience of gynæcologists, namely: "the predisposition to tubal pregnancy, reduced resistance to ascending gonorrhœal infection and to birth injuries which not infrequently result in uterine prolapse." You are apparently not familiar with the world medical literature on genital infantilism.

The same lack of knowledge is evidenced in your objection to Halban's operation of vesico-uterine fixation, which you misconceive as evidenced in your statement that "the uterus is sutured to the *parietal* peritoneum" showing that you have no idea of the technique of Halban's operation of vesico-fixation which has no reference whatsoever to the parietal peritoneum but to the bladder peritoneum.

You say that the operations of Baldwin-Mori and Schubert are *fully* described in the book. These operations are briefly mentioned or described in the book, and contrary to the long descriptions to which you refer, the operations are merely illustrated in each case by a single figure. This was necessary in order to give the reader an idea of these operations without elaborating upon them. Because of their historical importance in the surgical treatment of atresia of the vagina, these particular operations cannot be omitted in any comprehensive book on gynæcology. You give the false impression that we still favour these operations, whereas the book contains the statement that the Baldwin-Mori operation has been abandoned.

It is regrettable that you did not actually read the book because you would have seen the statement that "the construction of an artificial vagina by means of a plug covered with large Thiersch grafts is by far the simplest and safest method and at present the method of choice."

JOSEF NOVAK
I. C. RUBIN.

New York.

*** Where we chiefly differ from Professor Rubin and Professor Novak is in thinking that the comprehensiveness of their book reduces its efficacy as a guide for the students and practitioners for whom it was primarily designed. Admittedly no two readers (and no two reviewers) react alike; but our own feeling is that the non-specialist would usually welcome more emphasis, relatively, on what the authors regard as the best methods. At least, however, we can join with our correspondents in deploring our slip over the vesical peritoneum.—ED. L.

BILIGRAFIN FOR HYSTEROSALPINGOGRAPHY

SIR,—My experience with 'Biligrafin' for hysterosalpingography is limited to 16 cases. Unfortunately of the first 9 cases, done without anæsthesia under direct screening, 7 had considerable peritoneal irritation within four to six hours after examination with 50% solution. In 2 cases the symptoms were severe enough to keep the patients in bed for two days. I did not care to use the substance again, but in view of the conflicting reports from other centres I thought that possibly the extreme cold weather at the time might have affected the solutions and therefore used biligrafin this summer in a further 7 cases. Only 2 reported any symptoms, but on further inquiry we found another 4 who also had had symptoms of peritoneal irritation, nausea, abdominal pain, and in some cases actual vomiting. They had not troubled to report back to the clinic since they regarded these symptoms as something which they must accept as part of the examination.

As I have not encountered these symptoms with 'Ethiodan' and as biligrafin has the disadvantage of being excreted within one hour, so that it is not possible to take a late film to prove peritoneal dispersion of the medium, I felt that biligrafin had no advantage from my point of view and, because of the abdominal symptoms, many disadvantages from the patient's point of view. I understand from the makers that no other reports have arrived of such peritoneal symptoms, but it is just possible that patients may not always report back: at this clinic, most of the reports were received only when a follow-up letter had been sent to the patients. It would be interesting to know from Mr. McGregor and Dr. Sheach (Sept. 29) and Mr. Menzies (Oct. 13) whether the account of non-irritability is based on a direct follow-up questioning of each patient or on the fact that they did not voluntarily complain.

I am unable to explain the differences between my experience with biligrafin and those at other clinics.

Manchester Jewish Hospital. B. SANDLER.

MEDICAL EDUCATION

SIR,—The Royal College of Physicians of London have, in recent years, made persistent efforts to become the voice of authority on the medical curriculum. Each time there is an "official" review of the curriculum there is also an unsolicited pronouncement from the Royal College, giving their views on the subject. Lately the college have advocated that medical schools should be loosened from the shackles of the General Medical Council and left free to experiment with the training of the medical undergraduate.

They have now advanced one step further and invited medical schools to send delegates to the Royal College of Physicians to discuss the formation at the college of a centre for the consideration of problems related to medical teaching. The logical sequence is apparent. Should they lure a sufficient number of misguided people to the college, a "representative" committee would then be set up to advise the medical schools on matters of medical teaching. In a few years the advice will take the form of a notice of proposed changes in the medical curriculum, and the "representatives" will all be fellows of the college. So the Royal College of Physicians will have achieved its aim, and replaced the General Medical Council in the control and supervision of medical teaching.

While I have no personal animosity towards the Royal College of Physicians, who have within their own territory

a legitimate function, they are, and will remain, very much a vested interest, and in no way representative of the medical profession as a whole.

Might I suggest, therefore, that they should cease to trespass on the domain of the General Medical Council in this respect and content themselves with giving advice when it is asked for, on that part of the medical curriculum on which they are competent to make a contribution.

Department of Anatomy,
University of Glasgow. G. M. WYBURN.

*** Professor Wyburn is, we understand, referring to a meeting to be held at the college on Nov. 23. Since an invitation has gone to all medical schools in the United Kingdom, their representatives are likely to find themselves in a substantial majority; and for this (if no other) reason it is thought highly unlikely that our correspondent's forebodings will be justified.—ED. L.

TRANSAMINASE IN ISCHÆMIC HEART-DISEASE

SIR,—Your annotation of Sept. 15 may mislead readers with no personal experience of this test, because it infers that estimation of serum-transaminase is of little value in the detection and differential diagnosis of cardiac infarction. The reasons given in the annotation are: (1) failure, in some instances, to find a diagnostic rise after myocardial necrosis,[1,2] and (2) the occurrence of a rise after pulmonary embolism.[1] In our experience raised levels have not been missed if the test could be performed daily from the first to the third days after the onset of infarction, and in fact it is most unusual to miss the rise even if it is only possible to analyse blood taken on one of these days.

One[2] of the two papers instanced as reporting false negatives in fact states that "elevation of serum aminopherase [transaminase] levels occurred in 13 of 14 patients with proved cases of myocardial infarction. One patient who died of his infarction only $3^1/_2$ hours after onset had a normal serum aminopherase level." The other paper[1] reports that "breakdown of these persons with apparent false-negative diagnosis reveals that this group is comprised principally of those persons inadequately studied," but these authors did find no reason for the discrepancy in 3 patients (= 4·75%) of their cases of proved myocardial infarction. Even so they conclude that the "test appears to have a definite place in the diagnosis of acute myocardial infarction."

We fail to see how you can reconcile your statement "Myocardial infarction may take place and yet no diagnostic change in serum transaminase is found," with your agreement with the view that "estimation of serum-transaminase may be a useful guide in excluding, as opposed to diagnosing, myocardial necrosis."

Normal serum-transaminase levels after pulmonary embolism and after experimental pulmonary infarction are mentioned in five papers[3–7] of which that of Goldstein et al.[4] is based on 26 cases (21 of which had normal values, the other 5 being associated with conditions known to cause a rise in serum-transaminase). The paper[1] referred to in your annotation instances only 1 case of "pulmonary embolism" (in which the serum-transaminase was normal) and 3 cases of "probably pulmonary embolism," in which 2 of the 3 had values over 40 units.

1. Denney, J. L., McAuley, C. B., Martin, H. E., Ware, A. G., Segalove, M. *J. Amer. med. Ass.* 1956, **161**, 614.
2. Kattus, A. A. jun., Watanabe, R., Semenson, C., Drell, W., Agress, C. *Ibid*, 1956, **160**, 16.
3. Agress, C. M., Glassner, H. F., Jacobs, H. I. *Circ. Res.* 1956, **4**, 220.
4. Goldstein, F., Israel, H. L., Seligson, D. *New Engl. J. Med.* 1956, **254**, 746.
5. LaDue, J. S., Wróblewski, F., Karmen, A. *Science* 1954, **120**, 497.
6. Nydick, I., Wróblewski, F., LaDue, J. S. *Clin. Res. Proc.* 1955, **3**, 112.
7. Steinberg, D., Ostrow, B. H. *Proc. Soc. exp. Biol., N.Y.* 1955, **89**, 31.

During constant use of the serum-transaminase test in the past nine months we have in no instance encountered a rise after proven uncomplicated pulmonary embolism (7 cases), nor failed to find a significant rise at some time within the period 3 hours to 3 days after eventually proven cardiac infarction (26 cases, in 5 of whom electrocardiographic changes were equivocal). Acute pancreatitis is the only condition simulating cardiac infarction in which a raised level has been found.

We should like to thank Dr. Frances Gardner for her advice.

Department of Pathology,
Royal Free Hospital,
London, W.C.1. D. N. BARON
JOYCE BELL
CELIA OAKLEY.

*** The general conclusion of our annotation was that the serum-transaminase test may prove valuable both in clinical management and in prognosis, but that further evidence must be gathered. We are glad to hear, therefore, about the experiences of Dr. Baron and his colleagues. We did not intend to imply that the "estimation of serum-transaminase is of little value in the detection and differential diagnosis of cardiac infarction." What we did say is that at present the test seems to offer little *as a supplement to the electrocardiogram*. Our remark about the value of serum-transaminase in "excluding, as opposed to diagnosing, myocardial necrosis" ended with the important words, "if the test is done at the right time." If the serum-transaminase level is in fact ever raised after pulmonary embolism (and the published work suggests that it sometimes is), it seems particularly important to study those cases in which there is a rise. —ED. L.

CHRONIC ASTHMA TREATED WITH AEROSOL HYDROCORTISONE

SIR,—Quite properly, controlled trials are now in fashion for assessing new and old therapies; but we must guard against accepting conclusions as valid just because they rest on the sacred bolster of a blind controlled trial.

In their article last week Dr. Brockbank and his colleagues conclude that their trial suggests that hydrocortisone is useless in chronic asthma when administered as an aerosol. This suggestion is then made undeservedly forceful and respectable by the concluding sentence of their article. "This trial underlines once more the necessity for investigating new forms of treatment for asthma by the blind method if reliable deductions are to be made." Nine treated patients and equally few controls with the variation reported are too small a sample from which to draw conclusions or make suggestions; and certainly this trial is not a secure pulpit from which to preach the merits of blind experimentation.

There seems to be a growing belief that the double-blind method efficiently eliminates the confounding psychogenic factor in clinical trials. This is not so. Certainly it protects an investigator from his prejudice in favour of a treatment; but it does not protect him from the prejudice of thinking the treatment useless. Indeed it would seem that the open trial magnifies bias for a treatment and the blind trial magnifies bias against a treatment. The double-blind method is not a golden rule for excluding psychogenic bias.

Variability is an inherent property of all biological phenomena. The art of designing trials lies in making the correlation between the controls and the treated as high as possible rather than in trying to reduce or in ignoring this inherent variability. Great care is often taken to accomplish this as far as such factors as age and sex are concerned; if the psychogenic factor is regarded as a serious cause of variation, similar care should be

taken over it. I suggest that either an attempt should be made to measure the variation due to the psychogenic factor by running a blind and an open trial in parallel or that the patient should be used as his own control. The second course has much to commend it. A patient and his doctor can conduct such an experiment for themselves and answer the only question that is important for that particular patient: is the treatment good for me?

The advancing art of statistical inference has not yet become an exact science. Sir, if we accept blindly the pronouncements derived from blind experiments before it does, we are going to be a lot of muddled-up, misled doctors for a long time to come.

London, W.1. G. E. LOXTON.

RESPONSIVENESS TO ORAL HYPOGLYCÆMIC AGENT

SIR,—We have read with much interest the letter of Dr. Wolff and Mr. Stewart (Sept. 22) and we would like to explain the apparent differences.

Although in both studies the aim was the same—i.e., to predict responsiveness—and although in both series fallacies were encountered (1 out of 10 in our responsive cases but in a higher proportion in the series of Dr. Wolff and Mr. Stewart), yet the details of the two tests and the method of analysis of data and results differ.

Dr. Wolff and Mr. Stewart used a much bigger test dose (50 mg. per kg. of body-weight—i.e., 3–4·5 g.) while we used constantly 1 g. It is well known that both absorption and clearance rates of drugs alter according to dose—e.g., absorption is quicker the bigger the dose. It is also known that the pharmacological action of a drug largely depends on its concentration in the blood; Loubatieres et al.[1] found that maximal sulpha levels coincide with the lowest blood-sugar levels. In our study we found out that different test doses give different results as regards the time of maximum hypoglycæmia and the lowering of fasting blood-sugar (1, 2, and 3 g. were used).

In classifying our patients into groups according to the suggested test, we adopted the fasting blood-sugar level and that 4 hours after the test dose, disregarding the other figures in between or after 4 hours; while Dr. Wolff and Mr. Stewart considered the mean variations in blood-sugar levels up to 6 hours. Again, we compared the fall of blood-sugar resulting from the drug with (*a*) the fall after fasting for 4 hours, (*b*) the fall after 10 units of insulin hypodermically. Those patients who showed a greater difference resulting from the drug than from fasting or insulin were considered sensitive to the test and hence were assumed to be sensitive to continued drug therapy.

Thus the two tests—that of Dr. Wolff and Mr. Stewart, and ours—are not identical and hence not quite comparable.

Hunt et al.,[2] used the same test dose as that of Dr. Wolff and Mr. Stewart, but, like us, considered the blood-sugar fall only after 4 hours' fasting and 4 hours after B.Z.55; and their findings are similar to ours as regards the test.

Furthermore, Duncan et al.,[3] using the same test dose as that of Dr. Wolff and Mr. Stewart (3–4·5 g.), reported that "the value of the test in predicting individual response is limited to the fact that no patient who showed a fall less than 35% responded clinically to the drug in continued dosage." This agrees with our results; none of our 6 patients who did not respond to the test responded to continued therapy.

University of Alexandria, Egypt. M. H. GHANEM
MAURICE N. MIKHAIL.

1. Loubatieres, A., Goldstein, L., Metropolitanksi, J., Schaap, J. D. Comm. XLIII Congr. Médic. Alienistes et neurologistes, Oct. 28–30, 1942.
2. Hunt, J. A., Oakley, W., Lawrence, R. D. *Brit. med. J.* Aug. 25, 1956, p. 445.
3. Duncan, L. J. P., Baird, J. D., Dunlop, D. M. *Ibid*, p. 433.

Obituary

JOHN WILLIAM TREVAN

M.B., B.Sc. Lond., F.R.C.P., F.R.S.

Dr. J. W. Trevan, formerly director of the Wellcome Research Laboratories, died on Oct. 13. His career as a medical scientist in the laboratories of what is now the Wellcome Foundation is both interesting and instructive.

Born in 1887 at Bodmin in Cornwall, the son of J. W. S. Trevan, he was educated at the Plymouth council and technical schools, and entered the medical school at St. Bartholomew's Hospital in 1906. In 1908 he obtained the London B.SC. with honours in physiology and he qualified three years later. As a student he won the Foster prize in anatomy, the Harvey prize in practical physiology, the Brackenbury scholarship in medicine, and the Walsham and Burrows prizes in pathology. From 1912 to 1914 he was Fishmongers' research scholar in pathology. Between 1914 and 1920 he was successively house-physician, demonstrator of physiology, and casualty physician at Barts, except for a break during 1917–18 when he was acting as a pathologist with the R.A.M.C. in Salonika and Cairo. The influenza epidemic at the end of 1918 hastened his return to London.

In 1920 he joined the Wellcome Physiological Research Laboratories as pharmacologist. This was the beginning of a long scientific and administrative career in which he exerted an ever-extending influence. His greatest contribution to science was his application of statistical methods to biological standardisation. He had the wit to use the material at hand to the best advantage. In fact it was a disagreement with the licensing authority on the potency of an early batch of insulin that first led to his applying the statistical approach to the problem. His comments on his own activities were characteristic—namely, that he had the satisfaction of starting a number of hares, most of which had been finally caught by others. The one that has been pursued with most vigour was the introduction of statistical methods of estimation into pharmacology. According to Osler, Bishop Butler maintained that "Probability is the guide of life." Nowadays it has been made a guiding principle in pharmacology and biological standardisation. Trevan's most important paper on this subject was published in 1927 in the *Proceedings of the Royal Society*. It gave him an international reputation and contributed greatly to his election to the fellowship of the Royal Society in 1946. His interests in physiological problems were wide and included the study of the action of certain bacterial toxins, snake venoms, local anæsthetics, curarising agents, the control of respiratory and renal activities, and traumatic shock.

At the beginning of the late war he became director of the laboratories in succession to Dr. R. A. O'Brien. This was a difficult time for the laboratories. As elsewhere, work was hedged in with restrictions, newer drugs were developing, sera were being required in ever-increasing amounts, and antibiotics were looming ahead. Trevan successfully took the rough with the smooth. His responsibility for the whole of the laboratory activities and his duties as a director of the Foundation prevented him from doing a great deal of bench work, but his general interest never flagged and his advice was often sought and readily given. In 1943 he was elected F.R.C.P. In the years after the war the tempo of work did not slacken. The general research activities of the Foundation intensified, bio-assay which in the early days had been part of the research departments now became a part of the normal control organisation—the child which he had largely created had now grown up.

For the last few months after Kellaway's death he was acting research director-in-chief of the Foundation. He retired in 1953, and we looked forward to a long retirement when he could pursue his general interests under less strenuous conditions; and up to his death he was a familiar figure in the laboratories at Beckenham and Euston Road. His interest in scientific matters remained; his zest would have done credit to many younger men, and his enthusiasm was infectious. Indeed, he was about to take over the press editorship of the *British Journal of Pharmacology*.

He also served on the Biological Standards Commission of the League of Nations, the British Pharmacopœia Commission, and committees of the Medical and Agricultural Research Councils. He was an honorary lecturer at University College London, and a member of the board of studies in pharmacology in the University of London, a governor of St. Bartholomew's Hospital Medical College, a member of the Lister Institute, and the first vice-president of the British region of the Biometric Society. The societies to which he belonged showed the width of his interests—the biochemical, the physiological, the pathological, the pharmacological, and the biometric.

A. C. W.

By his first marriage, to Ida Kathleen, daughter of the Rev. J. L. Keys, Dr. Trevan had two daughters and three sons, two of whom are doctors. After her death he married in 1939 Margaret, the daughter of Sir Hubert Llewellyn Smith, and there are a son and two daughters of this marriage.

ARTHUR HAROLD GALE

D.M. Oxfd, D.P.H.

Dr. A. H. Gale, director of medical postgraduate studies and lecturer in epidemiology in the University of Bristol and honorary consultant in epidemiology to the United Bristol Hospitals, died in the Bristol Royal Infirmary on Oct. 12 at the age of 55.

He was the younger son of a general practitioner in Sheffield, and from Dover College he entered Trinity College, Oxford, in 1920 to take his preclinical subjects. In 1924 he took his B.A. in physiology in the final honours school of natural science and went to University College Hospital, London, for his clinical training. He qualified in 1926 and held an appointment as house-physician at University College Hospital before beginning his studies for the D.P.H. at the London School of Hygiene and Tropical Medicine under Sir Wilson Jameson. Soon afterwards he was appointed an assistant medical officer to Surrey County Council, and for three years he worked chiefly in their school medical service which gained much from his wisdom and personality. During these years he became interested in audiometry, and in 1933 he made this new science the subject of his thesis for the D.M.

[*A. & N. Studios*

Later that year he was selected from nearly fifty applicants for the post of medical officer to the Board of Education, and though young in years he rapidly showed not only acumen in administration and in thought but also a natural gift for establishing good personal relationships. One instance of his use of this talent is recalled by R. E. S., who writes:

To Gale more than anyone else belongs the credit for the happy liaison between the Medical Officers of Schools Association and the medical department of the Ministry of Education. The M.O.S.A., now over seventy years old, was originally run by public-school doctors, but later it was open to all who had an interest in schools and the Association gained much by the experience of those working in day-schools. However, the Ministry of Education, perhaps with good reason, held aloof and I think Gale was the first of their staff to join. He was an active member, a most efficient treasurer, and took part in our researches.

As time went on Gale made a special study of the incidence and morbidity of diseases in children, and when he was elected Milroy lecturer of the Royal College of Physicians in 1944 he took as his subject a Century of Changes in the Mortality and Incidence of the Principal Infections of Childhood. His constant preoccupation with this subject, especially as it touched poliomyelitis, led to his transfer in 1947 to the Ministry of Health, where he became a member of the epidemiological team. Two years later he was promoted a senior medical officer.

In 1950 the University of Bristol established a directorship of medical postgraduate studies, and Dr. Gale was selected as its first head.

This post, writes C. B. P., which was established partly to meet the new responsibilities placed upon the university by the introduction of the National Health Service, seemed ideally suited to Arthur Gale and he to it. His duties included the organisation of courses for general practitioners and for postgraduate diplomas, the supervision of the training of registrars, and the arrangements for pre-registration house-appointments throughout the South West Region. This work brought him into contact not only with the staff and students of the medical school but also with the administrative staff of the health services and with hospital consultants and general practitioners from Cheltenham to Land's End. To all of these he rapidly endeared himself by his quiet thoughtful manner, which no difficulties ever ruffled, and by his infinite patience and willingness to help. On coming to Bristol he chose to live in the secluded Somerset village of Chew Magna where he obtained much quiet enjoyment from the village life, his home and his garden. The last months were clouded by a struggle against progressive illness, but this he waged with his usual patience and courage.

In a personal tribute A. F. A. writes:

Arthur Gale was a man of great charm and patent integrity. A little gaunt and frail in appearance with a slight stoop, and looking rather older than his years, he gave the impression of a seriously minded and studious academician. By nature he was quiet and modest, kindly and generous in thought and action, but he possessed a sense of humour which was spontaneous and a delight to share. He made an impression on everyone whom he met and at once earned their respect. From those who came to know him better a warm affection grew, for he had a rich capacity for making and keeping friends, a gift which is not given to many. He was incapable of making enemies. He was much wrapped up in his work and at times he seemed oblivious of external influences, giving an impression of absentmindedness which was in reality evidence of his capacity for concentration of thought. His lively spirit as well as his mind made him a grand companion, and it was a joy to enter his home and to share in his happy family life.

He leaves a widow, a son, and a daughter.

CUTHBERT LINDSAY DUNN

C.I.E., L.R.C.P.E., D.P.H.

Lieut.-Colonel Dunn, a former director of public health in the United Provinces, India, died at Chislehurst, Kent, on Oct. 10. He was born at Valparaiso, Chile, in 1875 and was the son of Charles James Dunn of Dunnfield, co. Londonderry. He was educated at Dollar Academy and at Edinburgh University, and after qualifying in 1899 he served in the South African War before entering the Indian Medical Service in 1902. In 1904 he served in the Tibet campaign, and in 1910 he joined the public-health department of the United Provinces. He took the D.P.H. in 1914, and, after the interruption of the 1914–19 war, in which he was awarded the Serbian Order of St. Sava (4th class), he became surgeon-general of the department. He was appointed C.I.E. in 1928, and in 1932 he retired from the I.M.S.

When the Emergency Medical Service of the Ministry of Health was formed in preparation for the late war Dunn joined it as a hospital officer in the Cambridge region. In 1941 he transferred to the editorial staff of the *Official Medical History of the Second World War* and he wrote the two E.M.S. volumes, which were published in 1952 and 1953. A. MacN. writes:

As an editor Dunn was competent, critical, and at the same time kindly and sympathetic. Many contributors to this history have reason to be grateful for the ungrudging and personal help he gave to them. He was a typical Ulsterman—tall, clean-shaven, and of fair complexion. He had been a famous athlete in his student days and he played a good game of golf up to his eightieth year. I mourn a valued friend, a man of high integrity, a loyal servant of the Crown in peace and war, and an able medical historian.

Colonel Dunn is survived by his second wife, Kathleen Ellen, only daughter of A. D. Knott of Bickley, Kent, and by the two daughters of his first marriage.

HENRY SEARLE BAKER
M.R.C.S.

Dr. H. Searle Baker was a member of that honourable and dedicated band of general practitioners who have contrived, sometimes with more and sometimes with less success but always at a sacrifice to themselves, to combine original, and perhaps unorthodox, research with general practice.

He was born at Lewisham in 1893 and educated at Colfe's Grammar School. He entered Barts at the age of 16 and qualified in 1914 when he was 21. Almost at once he joined the R.A.M.C. During his service, attached to the Royal Sussex Regiment, he was severely wounded and suffered much ill health later. After demobilisation he settled in practice in Camden Town and was also deputy medical officer to Holloway Prison and a medical officer at the St. Pancras Infant Welfare Centre.

About 1928 Baker first formulated his hypothesis that the excessive growth of cells was controlled by substances secreted in the connective tissue of their area. For the next ten years or so, despite financial, administrative, and technical difficulties, he continued to develop this idea, and, so far as he could, its clinical applications. In our columns in 1935 and in 1937 he reported his results on a small group of patients whom he was able to treat at a public-assistance hospital.

During the late war he served with the R.A.F., with the rank of squadron-leader, and he made many trips in convoys in the *Queen Elizabeth* and other troopships. On demobilisation he returned to his general practice. Unhappily ill health soon forced him to retire, but he continued to work on medical boards for the Ministry of Pensions and of Labour. He had always been interested in journalism and he now turned to writing medical articles for the daily press. At the Press Club, where he was known as "The Doc," he soon won a new circle of friends. To his illness he made no concessions.

Dr. Baker died on Oct. 13. He leaves a widow and two sons, one of whom is a doctor.

Appointments

ANDERSON, G. S., M.B. Aberd., F.R.C.S.E.: part-time consultant in general surgery, Lewis Hospital, Stornoway.
BLAKE, ETHEL A. L., M.B. Dubl., B.A.O., D.OBST.: assistant maternity and child welfare M.O. and school M.O.H., Derbyshire.
CARSON, H. E. A., M.D. Lond., S.M. Harvard, D.P.H.: deputy M.O.H., Kensington and Chelsea.
HARRIS, W., M.R.C.S., D.O.M.S.: assistant ophthalmologist, Leicester Royal Infirmary.
HUTTON, J. N. T., M.B. Durh., F.F.A. R.C.S., D.A.: consultant anæsthetist, Royal National Throat, Nose and Ear Hospital, London.
INKSTER, J. S., M.B. Aberd., F.F.A. R.C.S., D.A.: consultant anæsthetist, Royal Victoria Infirmary, Newcastle upon Tyne.
LOW, N. C., M.B. Edin.: assistant psychiatrist, Rauceby Hospital, Sleaford.
MORRIS, M., M.R.C.S.: assistant maternity and child welfare M.O. and school M.O., Derbyshire.
MURDOCK, J. R., M.D. Edin., D.P.H., D.C.H.: M.O.H. and school M.O., Norwich.
SAKULA, ALEX, M.D. Lond., M.R.C.P.: consultant physician in chest diseases, Redhill and Horsham (Crawley) chest clinics.
SCOTT, B. O., M.R.C.S., D.PHYS.MED.: consultant assistant physician, department of physical medicine, United Oxford Hospitals and Oxford Regional Hospital Board.
VALAES, T., M.B. Athens, D.C.H.: registrar in pædiatrics, Southmead Hospital, Bristol.
VASS, M. T., L.R.C.S.I.: assistant maternity and child welfare M.O. and school M.O., Derbyshire.
WILKES, ANNA, M.B., D.P.H.: assistant M.O.H., East Ham.
WYPKEMA, W., M.B. Pretoria: surgical registrar, Cheltenham General Hospital.

Diary of the Week

OCT. 28 TO NOV. 3

Monday, 29th

POSTGRADUATE MEDICAL SCHOOL OF LONDON, Ducane Road, W.12
4 P.M. Dr. H. S. Banks: Recent Advances in Infectious Fevers.

Tuesday, 30th

BRITISH POSTGRADUATE MEDICAL FEDERATION
5.30 P.M. (London School of Hygiene and Tropical Medicine, Keppel Street, W.C.1.) Prof. E. C. Amoroso: Endocrinology of Pregnancy.
ST. MARY'S HOSPITAL MEDICAL SCHOOL, Paddington, W.2
5 P.M. Prof. Ian Aird: Postoperative Complications.
WEST LONDON HOSPITAL MEDICAL SCHOOL, W.6
5.15 P.M. Dr. T. Cecil Gray: Reflections on Circulatory Control. (Alex Simpson Smith lecture.)
INSTITUTE OF DERMATOLOGY, Lisle Street, W.C.2
5.30 P.M. Dr. J. O. Oliver: Bacterial Flora of Healthy Skin.
ROYAL STATISTICAL SOCIETY
5.30 P.M. *Medical.* (Westminster Medical School, Horseferry Road, London, S.W.1.) Dr. C. R. Lowe: An Association Between Smoking and Respiratory Tuberculosis.

Wednesday, 31st

UNIVERSITY OF LONDON
5 P.M. (St. Thomas's Hospital Medical School, S.E.1.) Prof. P. Dell (Paris): Physiology and Pharmacology of the Brain-stem Reticular Formation.
POSTGRADUATE MEDICAL SCHOOL OF LONDON
2 P.M. Dr. F. W. Wolff: Biochemistry of Diabetes. (Last of two lectures.)
ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE, 28, Portland Place, W.1
3.30 P.M. Air Marshal Sir James Kilpatrick: Aspects of Health in the Royal Air Force.
INSTITUTE OF DERMATOLOGY
5.30 P.M. Dr. Brian Russell: Rôle of Pyogenic Cocci in Skin Disease.
INSTITUTE OF DISEASES OF THE CHEST, Brompton, London, S.W.3
5 P.M. Mr. W. P. Cleland: Surgical Treatment of Bronchial Carcinoma.
INSTITUTE OF OBSTETRICS AND GYNÆCOLOGY
4.30 P.M. (Chelsea Hospital for Women, Dovehouse Street, S.W.3.) Mr. Douglas MacLeod: Problem of Endometriosis.
SOCIETY OF APOTHECARIES OF LONDON, Black Friars Lane, Queen Victoria Street, E.C.4
5 P.M. Dr. Leslie Cole: Interpretation of Symptoms in Hypertension.
6.15 P.M. Dr. J. H. Hunt: Management of Hypertension in General Practice.
RENAL ASSOCIATION
4 P.M. (41, Portland Place, W.1.) Dr. Vincent Hall (U.S.A.), Dr. Johannes Rhodin (Stockholm): Electron Microscopy of the Kidney.

Thursday, Nov. 1st

UNIVERSITY OF LONDON
5 P.M. (1, Wimpole Street, W.1.) Prof. Georges Portmann (Bordeaux): Physiology of Phonation. (Semon lecture.)
BRITISH POSTGRADUATE MEDICAL FEDERATION
5.30 P.M. (London School of Hygiene and Tropical Medicine.) Prof. W. J. Hamilton: Multiple Pregnancy.
FACULTY OF ANÆSTHETISTS OF THE ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, London, W.C.2
4 P.M. Dr. R. F. Woolmer: Artistry and Science in Anæsthesia. (Frederic Hewitt lecture.)
ASSOCIATION OF ANÆSTHETISTS OF GREAT BRITAIN AND IRELAND
9.30 A.M. (Royal College of Surgeons.) Opening of two-day Annual Meeting.
ROYAL EYE HOSPITAL, St. George's Circus, London, S.E.1
5.15 P.M. Dr. T. H. Whittington: Prisms and their Use in Refraction Work.
UNIVERSITY OF BRISTOL, Bristol, 8
8.15 P.M. Mr. T. Holmes Sellors: Surgery of the Thoracic Aorta. (Carey Coombs lecture.)
MIDLAND THORACIC SOCIETY
7.30 P.M. (Queen Elizabeth Hospital, Birmingham.) Dr. Paul Forgacs: The Management and Treatment of Tuberculous Pleural Effusion.
ST. ANDREW'S UNIVERSITY, Queen's College, Small's Wynd, Dundee
5 P.M. Dr. J. A. Fraser Roberts: Genetics of Essential Hypertension.

Friday, 2nd

ROYAL SOCIETY OF MEDICINE, 1, Wimpole Street, W.1
10.30 A.M. *Otology.* Mr. Philip Jory: Random Reminiscences. (Presidential address.)
2.30 P.M. *Laryngology.* Mr. J. Angell James: A Laryngologist's Views on Allergy. (Presidential address.)
5.30 P.M. *Anæsthetics.* Dr. Katharine Lloyd-Williams: The Anæsthetist's Rôle in Undergraduate Training. (Presidential address.)
POSTGRADUATE MEDICAL SCHOOL OF LONDON
10 A.M. Mr. David Trevor: Displastic Hip-joint in Older Children.
4 P.M. Dr. J. F. Goodwin: Coarctation of the Aorta.
ROYAL MEDICO-CHIRURGICAL SOCIETY OF GLASGOW
8.30 P.M. (Royal Faculty of Physicians and Surgeons, 242, St. Vincent Street, Glasgow, C.2.) Dr. J. A. W. McCluskie: Hyperparathyroidism—a not so rare disease.

Saturday, 3rd

INSTITUTE OF LARYNGOLOGY AND OTOLOGY, 330, Gray's Inn Road, London, W.C.1
11.30 A.M. Professor Portmann: Surgery of Cancer of the Base of the Tongue.

Notes and News

IMPERIAL CANCER RESEARCH FUND

IN 1902 the Royal College of Surgeons of England and the Royal College of Physicians of London jointly appointed a committee to draw up a scheme of research into the causes and treatment of cancer. This was the beginning of the Imperial Cancer Research Fund, whose story is now briefly retold in an illustrated brochure.[1]

The Fund has always employed its own full-time investigators, and particular attention has been given to the microscopic structure and artificial growth of tumours. In 1939 new laboratories were opened at Mill Hill, and much important work in the use of chemical agents was done. In 1951 a departure was made when the work of the fund was extended to include clinicopathological research—defined as the study of the human patient, by every means available, in relation to his disease. Carcinoma of the breast and prostate were particularly selected. For this, premises were taken at 48, Lincoln's Inn Fields, but these were soon found to be inadequate. Rooms are being used in the Royal College of Surgeons, and a new research centre is to be built next door to it. This, however, will cost about a million pounds to build and equip, and a tenth of that sum will be needed annually for running expenses. All this money must be found by public subscription, since the fund has no official income, and an appeal has now been launched.

IN ITS THIRD CENTURY

NEXT year the London Hospital will celebrate the bicentenary of its Royal Charter, and Mr. Robert Sinclair has written an attractive brief account[2] of its history and work.

It was founded in 1740, in an era when "hilarious public executions at Tyburn and a tour of the Bedlam madhouse were the sights of the town." A house was taken in Featherstone Street and a married couple employed as the sole staff. Subscribers and patients increased, and new quarters were taken. The hospital grew rapidly to become the largest voluntary hospital in England, until a wing of two hundred beds was destroyed by bombing in 1944. Today there are over seven hundred beds in the wards of the main building, besides several annexes.

In the first year of the hospital's existence, a pupil in surgery was admitted. Since then many students have been trained in the hospital's schools as doctors, dentists, midwives, physiotherapists, radiographers, and dietitians. Systematic training of nurses was begun by Eva Luckes, appointed matron in 1880 at the age of 24; Mr. Sinclair describes her tireless efforts to raise both the ethical and practical standards of nursing practice and to improve the conditions for patients and nurses. Pioneers in many branches of medicine have been on the London's staff, and the hospital has been served in our own times, in diverse ways, by such men as Hughlings Jackson, Henry Head, James Mackenzie, Frederick Treves, Lord Dawson, George Riddoch, William Bulloch, Philip Panton, and H.M. Turnbull—to say nothing of others happily still living. It was the first hospital in the Metropolis to establish a department of physical medicine; today the orthopædic and neurosurgical departments are among those with the largest number of beds.

Investigation into the causes of disease is as important as care of the sick, and it has long been an outstanding activity of The London. A substantial part of the charitable funds accumulated by the hospital is now used in this way; but public contribution to this work is still needed, even though the State has taken financial responsibility for the treatment of patients through the National Health Service. This work will continue and expand in the new Research Centre.

Mr. Sinclair's booklet emphasises less spectacular aspects of hospital life, such as the cleaning of a mile of corridors and the washing of 12,000 knives, forks, and spoons at every meal. There are many illustrations, besides tables of important dates and lists of the names of wards and many annexes of the hospital. He ends with a mention of the family spirit to be found there, and the continuity of a tradition of service through personal links with former members of the medical or nursing staff.

1. Obtainable from the central office of the Fund, Royal College of Surgeons, Lincoln's Inn Fields, London, W.C.2.
2. The London Hospital: Portrait of a Hospital in its Third Century. By ROBERT SINCLAIR. London, 1956. Pp. 47.

AFTER POLIOMYELITIS

THE Infantile Paralysis Fellowship was formed in 1939, by victims of poliomyelitis, to help each other to overcome the handicaps of disablement and especially the two great enemies of these people—loneliness and frustration. Since then it has grown steadily, and it now has over 11,000 members in over 70 branches all over the country, as well as a central office and a welfare department which deals with hundreds of individual problems each year. There is also a specially adapted hotel at Worthing where the members can enjoy a holiday with their families at moderate charges, or in special cases free of charge. Liaison is maintained with the Ministry of Labour departments concerned with the employment of disabled people, and with the branch of the Ministry of Health dealing with appliances and aids.

Opening a new headquarters for the Watford and District branch on Oct. 13, Sir Weldon Dalrymple-Champneys, F.R.C.P., expressed admiration for the achievements of the fellowship and especially of Mr. Frederick Morena, the founder-secretary. Despite the success obtained with the Salk vaccine, and the promising results with its British modification, Sir Weldon believed that the future lay with an attenuated live vaccine, of the type so successful in the prevention of smallpox, yellow fever, and tuberculosis. He pointed out that it was not only in the prevention of this disease that great progress had been achieved in recent years: the whole treatment of paralysis, involving the mechanism of breathing, had been revolutionised by the efforts of physicians, physiologists, engineers, nurses, and others in Sweden, Denmark, the United States, and not least in this country. Research stimulated and coördinated by the breathing-machines group of the Medical Supplies Working Party, set up by him at the Ministry of Health in 1946, had resulted in the devising of "iron lungs," cuirassses, &c., and the testing out and improvement of those of foreign origin, by experts to whose strenuous, able, and devoted work he paid a warm tribute.

University of London

Brigadier-General Sir Harold Hartley, F.R.S., will give two lectures at the School of Pharmacy, 17, Bloomsbury Square, W.C.1, at 5.30 P.M. on Nov. 14 and 15 on the contributions of pharmacy and chemical engineering to world needs.

University of Sheffield

Dr. D. A. Kent has been appointed assistant lecturer in biochemistry.

The Ashby de la Zouch urban district council is transferring to the university the balance of the fund raised to provide a memorial to the late Dr. Mark Baker. The fund will be used to endow a prize in the faculty of medicine.

Dr. Baker lost his life in August, 1955, in attempting to give medical help to two workmen overcome by fumes in a well at Ticknall, Derbyshire. He was a student of the university from 1932 to 1938.

Royal College of Physicians of London

On Oct. 8 the Bisset Hawkins medal was presented to Dr. G. S. Wilson "for his contribution to the promotion of preventive medicine by his able development and direction of the Public Health Laboratory Service." The citation continued:

"After a distinguished undergraduate career Wilson chose bacteriology as his life's work, and when the London School of Hygiene and Tropical Medicine became a school of the University of London he was appointed its professor of bacteriology as applied to hygiene. It was here that his research work on the bacteriology of water and of milk, and on the heat treatment of milk supplies, was so outstanding. With the coming of the second world war plans were made for the creation of a national laboratory service as one of the defences against the possibility of bacteriological warfare, and as this possibility became more and more remote the character of the service was so altered as to provide means of detecting and combating outbreaks of epidemic disease. The remarkable development of this service during the past ten years owes much to the ability and foresight of its director, Graham Selby Wilson. Under his guidance, this country is now covered by a network of public health laboratories working freely with the officers of the Ministry of Health, medical officers of health, hospital staffs and general practitioners."

Royal College of Physicians of Ireland

The following officers have been appointed for 1956–57:

President, Dr. F. J. O'Donnell; vice-president, Dr. R. B. Pringle; censors, Dr. R. B. Pringle, Dr. V. St. G. Breakey, Dr. M. D. Hickey, Dr. E. de Valera; representative on the General Medical Council, Dr. Edward Freeman; registrar, Dr. Charles Dickson; treasurer, Dr. Geoffrey Bewley.

University of Glasgow

The diploma of D.P.H. has been granted to Anna M. M. Lepper.

Royal College of Surgeons of Edinburgh

At a meeting of the college on Oct. 17, with Prof. Walter Mercer, the president, in the chair, the following were admitted fellows:

W. B. Ashby, Myint Aung, Asok Kumar Banerjee, G. J. Bendeich, Hertzog Berzen, W. J. Burfitt-Williams, A. B. Cassie, K. C. W. Condon, P. H. Crowe, R. G. K. de Castro, T. L. Dormandy, D. J. Erskine, A. J. Farmer, Kailash Chandra Garg, J. M. C. Gibson, J. A. Gillespie, M. V. Graham, B. D. Grant, J. G. Gray, Pattiyage Chandrasena Gunasinghe, Anand Swarup Gupta, Audrey Halloran, Damodaram Harirajan, Mohamed Altaf Hossain, David Howell, Felix Huber, S. J. Iceton, M. J. Inglis, K. J. Jacob, Israel Jaffe, Bhim Singh Jain, Satya Bhushan Kapur, Kershaw Burjo Khambatta, J. F. van Eyk Kirsten, B. D. Leckie, G. B. Leitch, Solomon Levitt, Jack Levy, Colin Lomas, N. W. McLeod, P. M. Marnie, J. F. O'Sullivan, B. P. Rooney, Ahmed Mustafa Salman, J. E. R. Scholtz, Wolf Silber, Reuben Silberman, J. J. Theunissen, A. R. Trist, D. G. Walker, O. Wesley-James, Stanley Whitfield, G. J. A. Wilson.

At the annual meeting held on the same day the following office bearers were elected for the coming year.

President, Sir Walter Mercer; vice-presidents, Prof. R. C. Alexander and Prof. John Bruce; secretary, Prof. George Scott; treasurer, Mr. J. J. Mason Brown; president's council, Mr. David Band, Mr. I. L. Dick, Prof. Norman Dott, Mr. A. J. C. Hamilton, Mr. J. N. J. Hartley, Prof. W. A. Mackey, Prof. Bryan McFarland, Dr. D. S. Middleton, Mr. T. M. Millar, Dr. Douglas Miller, Mr. R. Leslie Stewart, Mr. Robert Stirling, Mr. Robert Withers; representative on the General Medical Council, Mr. K. Paterson Brown; conservator of museum, Prof. D. E. C. Mekie; convener of museum committee, Prof. John Bruce; hon. librarian, Dr. Douglas Guthrie.

Royal Faculty of Physicians and Surgeons

Today, Friday, Oct. 26, at 5 P.M., Dr. W. E. Adams, professor of thoracic surgery in the University of Chicago, will deliver a lecture at the faculty, 242, St. Vincent Street, Glasgow, C.2, on primary lung cancer.

University of Khartoum

Mr. Julian Taylor, a vice-president of the Royal College of Surgeons of England and consulting surgeon to University College Hospital, has arrived at Khartoum to take up the chair of surgery.

Lister Medal

This medal for 1956 has been granted to Sir Stewart Duke-Elder, who will deliver the Lister lecture in London on April 5, 1958, under the auspices of the Royal College of Surgeons of England.

Remuneration of Doctors in the N.H.S.

Mr. Robin Turton, Minister of Health, addressing the annual conference of the Executive Councils Association in London on Oct. 18, said that there appeared to be some widespread misunderstandings about the profession's pay claim. It was not the case that the claim had been exhaustively examined in all its details and found wanting. "There has been no such examination of the details and we have passed no opinion on them." The Government had felt, he said, that the claim could not be reconciled with their policy of fighting inflation by exhorting all sections of the nation to observe restraint over increases both of prices and of wages and salaries. The Negotiating Committee had therefore been told that in the present circumstances the Government did not feel justified in considering any claim for a general increase in medical remuneration. He had not been able to accept the claim that there were contractual obligations to give pay increases; but "far from brushing it aside, we have readily agreed to a request made by the Negotiating Committee that the matter should be referred for legal advice at the highest level. That advice is now being obtained."

Mr. Turton pointed out that the claim was not concerned with any increases in practitioners' expenses. Other arrangements existed to cover these and extra money was being paid to meet them. "Doctors will, I hope, have a pleasant surprise when they receive their December cheques."

The British Medical Association subsequently issued a statement which said that anyone reading Mr. Turton's reference to "a pleasant surprise" might suppose that the Government was giving the doctor something extra and something new.

"It is, of course, doing nothing of the kind. This is the family doctors' own money, which they have already spent on the service and which has been owing to them for nearly two years. . . . It is ridiculous to speak of the repayment of this debt as though it were some kind of Christmas box and a 'pleasant surprise.' One might as well say that it should be a pleasant surprise for an employee when his firm makes up to him the bus fares he spent last year on their business."

University College Hospital, London

The next clinical demonstration for general practitioners at this hospital will take place on Sunday, Nov. 4, at 10.15 A.M., when Dr. Hugh Burt will speak on the rheumatic diseases. Admission without ticket.

Western Ophthalmic Hospital, London

On Wednesday, Nov. 7, the Mayor of St. Marylebone will unveil a plaque to mark the centenary of this hospital. A commemorative booklet has been published which reviews the hospital's past history and present facilities.

Symposium on Poliomyelitis

A symposium dealing with the epidemiology, virology, and clinical aspects of this disease will be held in the children's department at Farnborough Hospital, Kent, at 2.30 P.M. on Thursday, Nov. 1. The speakers will be Dr. A. D. Macrea, Dr. J. Marshall, and Dr. A. K. Peach. Visitors will be welcome.

Nursing Service to Industry and Commerce

Under this title a pamphlet (price 9*d*.) has been issued by the Royal College of Nursing (Henrietta Place, Cavendish Square, W.1) describing the salary scales and conditions of service of occupational-health nurses. The necessary qualifications and method of appointment are set out.

Association of Clinical Biochemists

At the annual general meeting of the association on Oct. 6 the following officers were elected: president, Prof. E. J. King; chairman, Dr. R. Gaddie; treasurer, Dr. I. MacIntyre; secretary, Dr. A. L. Tárnoky (Royal Berkshire Hospital, Reading).

Synthesis of Fat by Micro-organisms

Prof. T. K. Walker, D.SC., will speak on this subject at a joint meeting of the oil and fats group, the Liverpool section, and the microbiology group of this society to be held in the Nicholson Theatre, University of Liverpool, on Friday, Nov. 2, at 7.30 P.M.

Glasgow University Club, London

This club is holding its annual dinner at the Trocadero Restaurant, Piccadilly, on Thursday, Nov. 8, at 7.30 P.M. Applications for tickets should be sent to Dr. J. F. Heggie, the joint hon. secretary, North Middlesex Hospital, Edmonton, N.18, not later than Oct. 31.

Royal Society of London

Section of Anæsthetics.—This section is again offering a prize of £30 for the best paper submitted by a senior registrar or registrar in the National Health Service working in a clinical anæsthetic department. Further details can be had from the hon. secretary of the section, Royal Society of Medicine, 1, Wimpole Street, W.1.

St. John Ambulance Brigade

The annual conference of the surgeons of the brigade will be held at B.M.A. House, Tavistock Square, London, W.C.1, on Nov. 3 and 4. The speakers will include Sir Heneage Ogilvie and Mr. Patrick Clarkson. At the annual dinner on Nov. 3, to mark his 50 years of service, Major A. C. White Knox will be presented with his portrait by Miss Anna Zinkeisen.

Oxford University Medical Society

The speakers at this society during the Michaelmas term will include Sir Heneage Ogilvie (Oct. 30), Dr. John Bowlby (Nov. 6), Prof. G. W. Harris (Nov. 13), Prof. Alan Moncrieff (Nov. 20), Dr. A. W. Frankland (Nov. 27), and Prof. J. Chassar Moir (Dec. 4). The president is Mr. Hugh Champney (Oriel) and the secretary Miss Joan Wood (St. Hilda's).

Smog or Clean Air?

The Socialist Medical Association is to hold a conference on this subject at the Conway Hall, Red Lion Square, London, W.C.1, on Saturday, Nov. 10, at 2 P.M. The speakers will include Dr. Horace Joules, Dr. Hugh Price, and Dr. Barnett Stross. Further particulars may be had from the association, 86, Rochester Row, S.W.1.

The honorary degree of M.D. of the University of Melbourne has been conferred on Prof. A. M. Claye.

Sir John Stopford, F.R.S., has been made a freeman of the city of Manchester in recognition of "his outstanding services to the community as a teacher, a scientist, and as an administrator."

Sir Walter Mercer, F.R.C.S.E., Prof. John Bruce, Mr. Victor Riddell, and Mr. George Armitage, are to visit Russia at the end of this month, under the auspices of the British Council, at the invitation of a group of Russian surgeons.

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	mg. per oz.
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Fat (by acid hydrolysis)	2.0
Protein (N x 6.25)	14.9
Carbohydrate	72.5
Mineral Matter	2.6
Fibre	0.4
Moisture	8.5
	per oz.
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Vitamin B_1 (as Aneurin Hydrochloride)	0.17 mg.

	grm. per oz.
Fat (by acid hydrolysis)	0.57
Protein (N x 6.25)	3.98
Carbohydrate	20.59
	mg. per oz.
Iron	5.0
Calcium	120.0
Phosphorus	100.0
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Trace Elements: Copper	0.1
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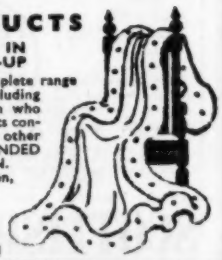

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FEBRUARY–APRIL, 1957

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The number of candidates accepted for the course will be limited to 15. The last date for the receipt of applications is Friday, 30th November, 1956.

Fees: £26 5s. plus £5 5s. for the course of 24 surgery lectures given at the College.

Further information of, and application forms for, this course may be obtained from Mr. W. F. DAVIS, Deputy Secretary, Royal College of Surgeons, Lincoln's Inn-fields, W.C.2 (Tel. HOLborn 3474).

UNIVERSITY OF MANCHESTER

DIPLOMA IN MEDICAL RADIOTHERAPY
(R.C.P. AND S. ENG.)

A COURSE OF INSTRUCTION IN RADIOTHERAPY will begin at the Christie Hospital and Holt Radium Institute, Manchester, in APRIL, 1957. This will continue until the end of JANUARY, 1958, after which students must still spend a further 15 months working either in the Holt Radium Institute or in another approved hospital. The course is full-time, non-resident, and the inclusive fee for the 10 months is £52.

Applications are invited from registered medical practitioners who fulfil the requirements as to previous medical experience laid down by the Examining Board in England (D.M.R.T. regulations obtainable from the London Conjoint Board, 8–11, Queen-square, London, W.C.1).

Applicants from Great Britain may be eligible for Senior House Officer appointments. Special consideration will be given to candidates possessing a higher qualification in medicine or surgery, and Registrar appointments may be available for such candidates.

Further information may be obtained from Dr. RALSTON PATERSON, Director, Christie Hospital and Holt Radium Institute, Wilmslow-road, Manchester, 20, or from the Dean of Postgraduate Medical Studies, The University, Manchester, 13, to whom applications should be sent not later than 5th January, 1957.

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Applicants should write to the Chairman of the Department of Psychiatry, McGill University, Montreal, Canada.

NAPT

SYMPOSIUM ON CHRONIC BRONCHITIS, WEDNESDAY, 12TH DECEMBER, 1956, 3.30–6.30 P.M. in B.M.A. House, W.C.1. Chairman: J. L. LIVINGSTONE, M.D., F.R.C.P. Introduction, NEVILLE C. OSWALD, T.D., F.R.C.P., and 9 other papers.

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INSTITUTE OF BASIC MEDICAL SCIENCES

ROYAL COLLEGE OF SURGEONS OF ENGLAND
BRITISH POSTGRADUATE MEDICAL FEDERATION
(UNIVERSITY OF LONDON)

LECTURES IN ANATOMY, PHYSIOLOGY AND PATHOLOGY
FEBRUARY–MAY, 1957

A course of Lectures in the above subjects will be held at the Institute from 11TH FEBRUARY to 17TH MAY, 1957. Applications for this Course will be limited. Fee £36 15s.

Closing date for applications Friday, 4th January, 1957.

Further information may be obtained from Mr. W. F. DAVIS, Secretary, Institute of Basic Medical Sciences, Royal College of Surgeons, Lincoln's Inn-fields, W.C.2 (Tel. HOLborn 3474).

SOCIETY OF APOTHECARIES OF LONDON

DIPLOMA IN INDUSTRIAL HEALTH

The next Examination will begin on MONDAY, 3RD DECEMBER, 1956. The following Examination will be held in July, 1957.

For Regulations apply Registrar, Apothecaries' Hall, Black Friars-lane, London, E.C.4.

CONTRACEPTIVE TECHNIQUE

LECTURE FILM DEMONSTRATION for FINAL YEAR MEDICAL STUDENTS from London Medical Schools in No. 1 Lecture Theatre, U.C.H. Medical School, FRIDAY, 9TH NOVEMBER, 1956, at 5.30 P.M. Chairman: Prof. W. C. W. NIXON, F.R.C.S., F.R.C.O.G. Speaker: Mrs. SYLVIA DAWKINS, M.B., B.S.

Admission free. No tickets required.

KING'S COLLEGE HOSPITAL MEDICAL SCHOOL. Applications are invited from persons holding a degree in Biochemistry or Physiology for the post of BIOLOGIST to the Hospital and Medical School. Salary within the range £500–£50–£700; F.S.S.U. and family allowances.

Further particulars of qualifications and experience should be sent to the Secretary, King's College Hospital Medical School, Denmark-hill, London, S.E.5, not later than 9th November, 1956.

THE UNIVERSITY OF LIVERPOOL. Department of BACTERIOLOGY. Applications are invited from medically or non-medically qualified candidates, with interests in biophysics or biochemistry, for the new post of LECTURER IN CHEMICAL MICROBIOLOGY, at an initial salary within the range £800–£1350 p.a., according to qualifications and experience.

Applications, stating age, academic qualifications and experience, together with the names of 3 referees, should be received not later than 1st December, 1956, by the undersigned, from whom further particulars of the conditions of appointment may be obtained. STANLEY DUMBELL, Registrar.

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Applications, stating age, academic qualifications and experience, together with proposed subjects of research and the names of 3 referees, should be received not later than 16th November, 1956, by the undersigned, from whom further particulars of the conditions of appointment may be obtained.

STANLEY DUMBELL, Registrar.

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Applications should be sent not later than 10th November, 1956, to the Registrar, The University, Manchester, 13, from whom further particulars and forms of application may be obtained.

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Applications (12 copies), together with the names and addresses of 3 persons to whom reference may be made, should be submitted within 14 days of the appearance of this advertisement to the undersigned, from whom further particulars may be obtained. G. R. HANSON, Registrar of King's College.

UNIVERSITY OF EDINBURGH. Department of Bacteriology. Applications are invited from medical graduates for the post of LECTURER in the Department of Bacteriology. The successful candidate will be expected to act as an Assistant Bacteriologist in the Royal Infirmary, and to undertake certain teaching duties. Salary scale £700–£100–£1100; Bar £1200–£100–£1600 p.a., with placement according to qualifications and experience and with superannuation benefit and family allowance where applicable.

Further particulars may be obtained from the undersigned with whom applications (6 copies), together with the names of 2 referees, should be lodged not later than 10th November, 1956. CHARLES H. STEWART, Secretary to the University.

UNIVERSITY OF COLORADO MEDICAL CENTER. DEPARTMENT OF PEDIATRICS, DENVER, COLORADO. Pediatrician with training in Chemistry (Micromethods) and a creative research orientation is wanted for the position of INSTRUCTOR or ASSISTANT PROFESSOR OF PEDIATRICS. Permanent appointment starting at $7000 a year and travel costs.

Submit curriculum vitae, publicational reprints, 2 letters of reference, and small photograph, to Prof. C. HENRY KEMPE, Department of Pediatrics, University of Colorado Medical Center, Denver, Colorado.

UNIVERSITY OF KHARTOUM. Applications are invited for :—

(1) SENIOR LECTURESHIP or (2) LECTURESHIP in :—

(*a*) Public Health, and

(*b*) Pathology.

Salary scales : (1) £E2202–£E75–£E2577 p.a., (2) £E1652–£E75–£E2177 p.a. Entry point according to qualifications and experience. Cost-of-living allowance approximately £E120 p.a. Outfit allowance £E50. Family allowances : wife—£E60 p.a., first child—£E90 p.a., second and third child—£E30 p.a. Passages for appointee and family on appointment, termination and annual leave. Appointments on contract for 5 years with possibility of renewal. Superannuation scheme.

Candidates for these posts may apply for secondment from the National Health Service for a period of up to 3 years under the terms of circular letter No. NHB/(52) 106EG/(52) 101 of 30th September, 1952.

Detailed applications (8 copies), naming 3 referees, to be received by 20th November, 1956, by Secretary, Inter-University Council for Higher Education Overseas, 29, Woburn-square, London, W.C.1, from whom further information may be obtained.

UNIVERSITY OF KHARTOUM. Applications are invited for :—

(1) SENIOR LECTURESHIP and (2) LECTURESHIP IN ANATOMY.

Salary scales : (1) £E1902–£E75–£E2277 p.a., (2) £E1402–£E75–£E1927 p.a. Entry point according to qualifications and experience. Cost-of-living allowance approximately £E120 p.a. Outfit allowance £E50. Family allowances : wife—£E60 p.a., first child—£E90 p.a., second and third child—£E30 p.a. Passages for appointee and family on appointment, termination and annual leave. Superannuation scheme.

Candidates for these posts may apply for secondment from the National Health Service for a period of up to 3 years under the terms of circular letter No. NHB/(52) 106EG/(52)101 of 30th September, 1952.

Detailed applications (8 copies), naming 3 referees, by 20th November, 1956, to Secretary Inter-University Council for Higher Education Overseas, 29, Woburn-square, London, W.C.1, from whom further information may be obtained.

QUEEN'S UNIVERSITY, Kingston, Ontario. Applications are invited for the CHAIR OF ANATOMY, commencing September, 1957. Salary range $7000–$9500, depending upon qualifications and experience.

Address applications to Dean of Medicine, Queen's University, Kingston, Ontario, Canada.

Hospital Services : Senior Appointments

NORTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD.

Full-time ASSISTANT PSYCHIATRIST (Senior Hospital Medical Officer grade) at Goodmayes Hospital, Ilford, Essex. Experience in E.E.G. an advantage.

Maximum Part-time CONSULTANT PHYSICIAN in Physical Medicine to North Middlesex Hospital and annexes.

Applications (6 copies), and names of 3 referees, should reach the Secretary, 11A, Portland-place, London, W.1, by Saturday, 10th November.

NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD.

(1) CHILD PSYCHIATRIST (4 half-days a week), Senior Hospital Medical Officer grade, Bedfordshire Child Guidance Service. Duties will cover the service in the southern part of the County, and will be based on the Clinics at 11, Gordon-street, Luton, and Health Centre, Dunstable, which may be visited by direct appointment.

Applications before 28th November, 1956.

(2) OPHTHALMOLOGIST (Senior Hospital Medical Officer grade), St. Pancras School Treatment Centre, 25, Prince of Wales-road, N.W.5. Duties involve 2 visits a week (Monday and Wednesday afternoons), each 2½ hours clinical time, and candidates may apply for either or both of these sessions. Clinic may be visited by arrangement with the Divisional Medical Officer, 313–319, Harrow-road, W.9.

Applications before 3rd December, 1956.

Application forms obtainable from, and returnable to, Secretary, North West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1.

ROYAL MASONIC HOSPITAL, Ravenscourt Park, London, W.6. Applications are invited from Fellows of one of the Royal Colleges of Surgeons for the appointment of CONSULTANT E.N.T. SURGEON at the above Hospital as from 1st April, 1957. Candidates must be engaged in consulting practice and well established in their profession.

Applications, giving detailed information and the names and addresses of 3 referees, should reach the undersigned (from whom further information may be obtained) on or before 30th November, 1956.

R. E. LAWSON, Secretary and House Governor.

ST. THOMAS'S HOSPITAL, London, S.E.1. Assistant RADIOLOGIST (whole-time). Salary £1575–£2025 p.a.

Applications, naming 2 referees, to the Clerk of the Governors by 9th November, 1956.

ST. GEORGE'S HOSPITAL, S.W.1. Applications are invited for a Part-time CONSULTANT post in Orthopædics to the St. George's Hospital Group. Candidates must be Fellows of the Royal College of Surgeons (England). The appointment will be for 3 notional half-days per week in the first instance. The successful candidate will be required to take up duty as soon as possible, and remuneration and conditions of service will be those applicable to part-time Consultant staff under the National Health Service.

Applications, stating age, education, qualifications and experience, together with the names of 3 referees, should reach the undersigned not later than 24th November, 1956.

P. H. CONSTABLE, House Governor.

ST. JOHN'S HOSPITAL FOR DISEASES OF THE SKIN, Lisle-street, Leicester-square, London, W.C.2. Applications are invited for the appointment of CONSULTANT DERMATOLOGIST to the Hospital for 1 session a week. Applicants must be Fellows or Members of the Royal College of Physicians of London.

Applications (10 copies), stating age, qualifications, and experience, with names of 3 referees, should be addressed to the Secretary to the Board of Governors not later than 8th December, 1956.

WESTMINSTER HOSPITAL, St. John's-gardens, S.W.1. Applications invited for 2 posts of CONSULTANT RADIOLOGIST, each of 7 half-days weekly. Specialised experience in neuroradiology is required for 1 post. Candidates must have a higher qualification.

Applications (12 copies), to include the names of 3 referees, should be sent to the House Governor, not later than 26th November, 1956.

EAST ANGLIAN REGIONAL HOSPITAL BOARD. CONSULTANT DERMATOLOGIST (7 notional half-days) required at hospitals in the King's Lynn, Wisbech and Peterborough Areas. Wide experience and higher qualification essential.

Applications (8 copies), stating age, experience and the names of 3 referees, to Board's Senior Administrative Medical Officer, 117, Chesterton-road, Cambridge, by 5th November, 1956. Candidates invited to visit hospitals concerned by arrangement with the Hospital Management Committee Secretary, West Norfolk and King's Lynn Hospital, King's Lynn.

LEEDS REGIONAL HOSPITAL BOARD. Whole-time Locum SENIOR HOSPITAL MEDICAL OFFICER in Geriatrics required for duties in the Bradford area. Appointment will be for 3 months in the first instance. A house is available, if required.

Applications, stating age, qualifications, and details of present and previous appointments with dates, together with the names and addresses of 2 referees, to the Secretary, Park-parade, Harrogate, as soon as possible.

LIVERPOOL REGIONAL HOSPITAL BOARD. Applications are invited for the post of Part-time CONSULTANT DERMATOLOGIST giving 2 notional half-days in the Chester and District Group and including occasional visits to mental hospitals and sanatoria in the area. Applicants should possess a higher qualification and have had extensive experience in dermatology.

Forms of application from, and to be returned to, Dr. T. Lloyd Hughes, Senior Administrative Medical Officer, Liverpool Regional Hospital Board, 19, James-street, Liverpool, 2, to be received not later than 17th November, 1956.

VINCENT COLLINGE, Secretary to the Board.

MANCHESTER REGIONAL HOSPITAL BOARD.

(*a*) Whole-time or maximum Part-time ASSISTANT ANÆSTHETIST (Senior Hospital Medical Officer) to the Bolton and District Hospitals (mainly at Bolton Royal Infirmary and the Bolton District General Hospital, Farnworth). Wide experience essential, higher qualification desirable. 13th November, 1956.

(*b*) Whole-time SENIOR CASUALTY OFFICER at Preston Royal Infirmary, resident or non-resident. Appointee will work under general supervision of Consultants. Tenure of post limited to 4 years ; salary within range £1575–£50–£2025 (according to experience, &c.). 15th November, 1956.

(*c*) *Amended Advertisement*

Whole-time RESIDENT ASSISTANT PSYCHIATRIST AND DEPUTY MEDICAL SUPERINTENDENT (Senior Hospital Medical Officer), Mary Dendy Hospital, Alderley Edge, Cheshire (about 400 Beds for mental defectives), with some duties at Cranage Hall Hospital, Cheshire (about 500 Beds). Good experience essential ; D.P.M. desirable. 12th November, 1956.

Application forms from the Senior Administrative Medical Officer to the Board, Cheetwood-road, Manchester, 8, to be returned by dates stated.

MANCHESTER. UNITED MANCHESTER HOSPITALS. MANCHESTER ROYAL EYE HOSPITAL. Applications are invited for the post of Part-time (9 sessions) SENIOR HOSPITAL MEDICAL OFFICER (non-resident). Previous experience in ophthalmology essential. The terms and conditions of service for hospital medical and dental staffs will apply.

Applications, giving details of past experience and qualifications, together with the names of 3 referees, to be addressed to the undersigned as early as possible. (Special application forms can be obtained on request.)

F. J. CABLE, Secretary, United Manchester Hospitals.

The Lodge, Oxford-road, Manchester, 13.

NEWCASTLE REGIONAL HOSPITAL BOARD. Locum ANÆSTHETIST, Gateshead Group of hospitals for period of 6–9 months. Salary 31½ guineas or 45 guineas per week according to status.

Applications, together with names and addresses of 3 referees, to Senior Administrative Medical Officer, Newcastle Regional Hospital Board, Benfield-road, Newcastle upon Tyne, 6, immediately.

SCOTLAND. NORTHERN REGIONAL HOSPITAL BOARD. Applications are invited for the post of MEDICAL SUPERINTENDENT of the Inverness Group of hospitals. The salary scale is £1700–£75(2)–£1850–£100–£1950. A house is available at the Royal Northern Infirmary, Inverness.

Schedules of application and further particulars of the post are obtainable from the undersigned with whom applications should be lodged by 3rd November, 1956.

A. M. FRASER, M.D.,
Secretary and Administrative Medical Officer.
Office of the Northern Regional Hospital Board,
Raigmore, Inverness.

SCOTLAND. SOUTH-EASTERN REGIONAL HOSPITAL BOARD. Applications are invited for the post of Whole-time or maximum Part-time CONSULTANT RADIOTHERAPIST at the Royal Infirmary and the Western General Hospital, Edinburgh.

Applications, giving particulars of age, qualifications, and previous experience, together with the names of 3 referees, should be sent to the Secretary, South-Eastern Regional Hospital Board, Scotland, 11, Drumsheugh-gardens, Edinburgh, 3, by 17th November, 1956.

SCOTLAND. SOUTH-EASTERN REGIONAL HOSPITAL BOARD. Applications are invited for the post of Whole-time or maximum Part-time CONSULTANT ANÆSTHETIST to the Northern Group of hospitals and the Department of Surgical Neurology at the Royal Infirmary of Edinburgh and Bangour Hospital. The duties of the post will be shared approximately equally between the Neuro-surgical Department and the general surgical work of the Northern Group.

Applications, giving particulars of age, qualifications, and previous experience, together with the names of 3 referees, should be sent to the Secretary, South-Eastern Regional Hospital Board, Scotland, 11, Drumsheugh-gardens, Edinburgh, by 17th November, 1956.

SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD. Applications are invited for the following appointments :—

CONSULTANT PHYSICIAN at the Southern General Hospital, Glasgow, with cardiological duties at that Hospital and at Shieldhall Hospital. The appointment will be whole-time or on the maximum basis of 9 notional half-days per week.

CONSULTANT SURGEON at the Royal Infirmary, Glasgow. The appointment will be part-time on the basis of 7 notional half-days per week.

These appointments are subject to the National Health Service (Scotland) superannuation regulations.

Applications (16 copies), stating date of birth, qualifications, experience, present appointment, and the names of 3 referees, to reach the Secretary, Western Regional Hospital Board, 64, West Regent-street, Glasgow, C.2, not later than 30 days after the publication of this advertisement.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for an appointment as Part-time CONSULTANT in E.N.T. Surgery for 9 notional half-days a week, in the South-East Kent Group of hospitals. Candidates must have had wide experience in E.N.T. surgery and be Fellows of a Royal College of Surgeons. The appointment will be in accordance with the terms and conditions of service of hospital medical and dental staffs (England and Wales). Candidates may visit the hospitals concerned.

Apply, stating nationality, age, sex, qualifications, and experience, including details of present appointment and of war service, together with the names and addresses of 3 referees, to the Secretary, Advisory Appointments Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, London, W.1, not later than 10th November, 1956.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited to fill a vacancy for a Whole-time ASSISTANT PSYCHIATRIST at Leybourne Grange Colony, West Malling, Kent, which is an establishment for the training of mental defectives. Candidates must have had wide experience in psychiatry and previous mental deficiency experience ; possession of a higher qualification is desirable. Salary within the scale £1575–£50–£2025. An unfurnished house is available for a married practitioner. Applicants may visit the Hospital.

Apply, stating nationality, age, sex, qualifications, and experience, including details of present appointment and of war service, together with the names and addresses of 3 referees, to the Secretary, Advisory Appointments Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, W.1, not later than 10th November, 1956.

SOUTH-WESTERN REGIONAL HOSPITAL BOARD. BRISTOL MENTAL HOSPITALS GROUP. Applications are invited for the whole-time appointment of CONSULTANT PSYCHIATRIST in the Bristol Clinical Area. Applicants must possess a higher qualification in medicine and the D.P.M. The duties of the successful candidate will be mainly at Barrow Hospital, the Neurosis Unit, and the Day Hospital. The post offers considerable opportunities for clinical research and for undergraduate and postgraduate teaching. A modern house is available at Barrow Hospital.

Applications (12 copies), stating date of birth, qualifications, and experience, together with the names and addresses of 2 referees, should be sent to the Secretary of the Regional Hospital Board, 27, Tyndalls Park-road, Bristol, 8, not later than 17th November, 1956.

WELSH REGIONAL HOSPITAL BOARD. Whole-time ASSISTANT PSYCHIATRIST (Senior Hospital Medical Officer) Cefn Coed Hospital, Swansea (710 Beds). Candidates should possess D.P.M. Successful candidate will work under Consultant Psychiatrists.

Applications (12 copies), naming 3 referees, to Senior Administrative Medical Officer, Temple of Peace, Cathays Park, Cardiff, within 21 days.

SHEFFIELD REGIONAL HOSPITAL BOARD. Part-time CONSULTANT ORTHOPÆDIC SURGEON required for 8 notional half-days per week for the Mansfield Hospital Area.

Application forms and further details from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, 10. Forms to be returned by 17th November, 1956.

NEW ZEALAND. THE OTAGO HOSPITAL BOARD, DUNEDIN, NEW ZEALAND. Applications are invited for the position of DIAGNOSTIC RADIOLOGIST, Otago Hospital Board. Applicants must hold a degree in medicine of an approved university and possess a higher qualification in the specialty. The salary payable will be that of a Junior or Senior Specialist under the Hospital Employment Regulations, viz. : £1600–£2300 p.a. The commencing salary will be determined in accordance with the qualifications and experience of the appointee. The position is a full-time and non-resident one. Travelling expenses as set out in the conditions of appointment will be paid when a contract of service is signed.

Conditions of appointment and application forms may be obtained from the Office of the High Commissioner for New Zealand, 415, Strand, London, or from THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2. Applications, stating age, qualifications and experience, together with testimonials, Health and Radiological Certificates, will be received by the undersigned until 10 A.M. on Monday, 21st January, 1957.

W. A. WILLIAMSON, Secretary, Otago Hospital Board.
P.O. Box 946, Dunedin, New Zealand.

NEW ZEALAND. COOK HOSPITAL BOARD, Gisborne, NEW ZEALAND. Applications, closing on Monday, 3rd December, 1956, are invited from registered medical practitioners for the appointment of PATHOLOGIST.

Salary in accordance with the Hospital Employment regulations salary rates for the following gradings :—

Senior Specialist : £2000–£2300.
Junior Specialist : £1600–£1900.

The amounts quoted are in New Zealand currency.

The position is non-resident but the Board will endeavour to make available temporary accommodation, Gisborne, with a population of 21,000, is situated on the sea coast and enjoys an ideal climate.

An information leaflet giving conditions of appointment may be obtained from The High Commissioner for New Zealand, 415, Strand, London, W.C.2. Completed applications to be sent by air-mail direct to Cook Hospital Board, Gisborne, N.Z.

TASMANIA. LAUNCESTON GENERAL HOSPITAL, LAUNCESTON. Applications, in duplicate, addressed to the Agent General for Tasmania, 457, Strand, London, W.C.2, and closing on 10th November, 1956, are invited from medical practitioners registrable in Tasmania for appointment to the position of PSYCHIATRIST. The position is a full-time appointment at the Launceston General Hospital.

Qualifications : Preference will be given to the candidates in possession of 1 or more of the following higher qualifications—M.D., M.R.C.P., M.R.A.C.P., and/or D.P.M. Experience in psychiatry is essential.

Normal working hours from 9 A.M. to 5.30 P.M., Monday to Friday inclusive, with emergency calls as required. Limited consultative private practice outside these working hours is permitted.

Salary range : £A2500–£100–£3000.
Annual recreation leave : 28 days.
Superannuation benefits available.

An assisted passage can be arranged through the Agent General for Tasmania.

Accommodation : A house is available, if required, on a rental basis.

Further particulars available from the Agent General for Tasmania.

WESTERN AUSTRALIA. ROYAL PERTH HOSPITAL. Applications are invited for the vacant post of PATHOLOGIST. Salary £A2950 p.a. Conditions equivalent to State Public Service, including long service leave and provision for superannuation. The Royal Perth Hospital is the main Teaching Hospital associated with the University of Western Australia. It has more than 600 Beds and is extending. The Hospital's Pathology Department is under the direction of the Professor of Pathology. The vacant position is that of a Senior Pathologist able to take responsibility for the Hospital's work in pathology under the general supervision of the Professor. It is envisaged that the selected candidate will in addition be encouraged to take part in teaching. A memorandum of further particulars concerning this position will be supplied upon request either to the undersigned or the Agent General for Western Australia, Savoy House, Strand, London, W.C.2.

In addition to all relevant personal details, applications must include particulars of qualifications, experience, publications ; the names of 2 referees ; and should reach the undersigned on or before 31st December, 1956.

JOSEPH GRIFFITH, Administrator.

Hospital Services : Junior Appointments

BETHNAL GREEN HOSPITAL, Cambridge Heath-road, London, E.2. (Acute General—307 Beds.) HOUSE SURGEON required. Post vacant 4th November, 1956. Pre-registration. Recognised for the F.R.C.S.

Applications, stating qualifications, experience, and with copies of 2 testimonials, to the Hospital Secretary.

CONNAUGHT HOSPITAL, Walthamstow, E.17. (118 Beds.) HOUSE SURGEON required for 6 months (General Surgery and Special Departments). Post vacant 1st December, 1956. Recognised for F.R.C.S.

Applications, with full details and copies of 2 recent testimonials, should be sent immediately to Secretary, Hospital Management Committtee, Forest Group, Langthorne-road, E.11.

CHARING CROSS HOSPITAL, W.C.2. Applications are invited for the post-registration post of RESIDENT ANÆSTHETIST, tenable for 6 months from 1st January, 1957.

Application forms to be returned to the undersigned by 20th November, 1956.

FRANK HART, Secretary to the Board.

CHARING CROSS HOSPITAL, W.C.2. Applications are invited for the following pre-registration appointments, tenable for 6 months from 1st January, 1957 :—

(*a*) **Charing Cross Hospital**
HOUSE PHYSICIAN to the Radiological Department.
(*b*) **Mount Vernon Hospital**
HOUSE SURGEON.
(*c*) **Harrow Hospital**
1 HOUSE PHYSICIAN.
2 HOUSE SURGEONS.
(*d*) **Wembley Hospital**
1 HOUSE PHYSICIAN.
3 HOUSE SURGEONS.

Application forms to be returned to the undersigned by 20th November, 1956.

FRANK HART, Secretary to the Board.

COLINDALE HOSPITAL, Colindale-avenue, London, N.W.9. NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Whole-time MEDICAL REGISTRAR (resident or non-resident), required at above Hospital, which accommodates 300 tuberculosis patients. Experience in diseases of the chest desirable. The Hospital, which is within easy access of the centre of London, may be visited by direct appointment with the Physician-Superintendent.

Application forms obtainable from, and returnable to, the Group Secretary, Edgware General Hospital, Edgware, by 6th November, 1956.

GUY'S HOSPITAL, S.E.1. Applications are invited for the post of REGISTRAR (part-time) in Ophthalmology at Guy's Hospital, with duties on 2 sessions per week. The appointment will be for 1 year in the first instance, commencing as soon as possible.

Forms of application are obtainable from, and should be lodged with, the Superintendent, Guy's Hospital, London Bridge, S.E.1, not later than 1st November, 1956.

GUY'S HOSPITAL, S.E.1. Applications are invited for the post of REGISTRAR (part-time) in the Department of Venereal Diseases at Guy's Hospital with duties on 6 sessions per week. The appointment will be until 30th September, 1957, in the first instance, commencing as soon as possible.

Forms of application are obtainable from, and should be lodged with, the Superintendent, Guy's Hospital, London Bridge, S.E.1, not later than 1st November, 1956.

GERMAN HOSPITAL, Dalston, London, E.8. (General—157 Beds.) Applications are invited for the 12 months appointment (vacant early November) of RESIDENT CASUALTY OFFICER (Senior House Officer grade) and should be sent to Group Secretary, Hackney Hospital, London, E.9, quoting GH/SHO.

HACKNEY HOSPITAL, London, E.9. (General—841 Beds.) Applications for the 6 months resident appointment of registered HOUSE PHYSICIAN should reach the Secretary, above address, by 9th November, quoting HH/HP.

HACKNEY HOSPITAL, London, E.9. (General—841 Beds.) Applications are invited from registered practitioners for the 6 months appointment (vacant 28th November) of RESIDENT CASUALTY OFFICER AND HOUSE PHYSICIAN (Skin Department), House Officer grade, and should be sent to the Secretary, above address, quoting HH/COS.

NORTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD AND BOARD OF GOVERNORS OF ST. BARTHOLOMEW'S HOSPITAL. SENIOR REGISTRAR (diseases of the chest). Appointment will be for 2 years at Broomfield Hospital, near Chelmsford (resident), with visits to St. Bartholomew's Hospital, E.C.1, and 2 years at the Southend Chest Unit (resident or non-resident, single accommodation available). Broomfield Hospital (335 Beds—Tuberculous and Non-Tuberculous Thoracic Surgery Unit, outpatient clinics and Mass Radiography Unit). Duties chiefly at Southend Chest Clinic but also in Unit at Rochford Hospital and with diagnostic beds at Westcliff Hospital. Southend Chest Unit offers excellent opportunities for research. Appointment subject to annual review.

Application forms from Secretary, North East Metropolitan Regional Hospital Board, 11A, Portland-place, W.1, to be returned by 10th November, 1956.

NORTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD.

ANÆSTHETIC REGISTRAR (resident), Chelmsford and Essex and St John's Hospitals, Chelmsford, Essex Recognised for D.A. and F.F.A.R.C.S.

ANÆSTHETIC REGISTRAR (non-resident, sleeping in on duty nights), Chase Farm Hospital and other hospitals in the Enfield Group, Enfield, Middlesex. Post offers wide experience in anæsthesia and is recognised for D.A. and F.F.A.R.C.S.

SURGICAL REGISTRAR (resident), Herts and Essex General Hospital, Bishop's Stortford, Herts. Recognised for F.R.C.S.

REGISTRAR in Pathology (resident), Herts and Essex General Hospital, Bishop's Stortford, Herts.

REGISTRAR in Diseases of the Chest (non-resident), Shoreditch and Metropolitan Chest Clinics, at St. Leonard's and the Metropolitan Hospitals.

REGISTRAR in Obstetrics and Gynæcology (non-resident, sleeping in on duty nights). Chase Farm Hospital and other hospitals in the Enfield Group, Enfield, Middlesex (48 obstetric beds and 40 gynæcological beds). Recognised for D.Obst. R.C.O.G. and M.R.C.O.G.

Appointments subject to review after 1 year.

Application forms from Secretary, 11A, Portland-place, W.1, to be returned by 10th November, 1956.

LAMBETH HOSPITAL, Brook-drive, S.E.11. Applications are invited from pre-registration and registered medical practitioners for the position of RESIDENT HOUSE SURGEON falling vacant on 5th December, 1956. The successful candidate will be required to carry out a fortnight's locum duty starting on 21st November, 1956.

Application forms from the Physician-Superintendent. Stamped addressed envelope should be enclosed.

LONDON CHEST HOSPITAL. Hospitals for Diseases OF THE CHEST. Applications are invited for the appointment of RESIDENT MEDICAL OFFICER. Appointment for 1 year from 1st December, 1956, and graded as Registrar.

Applications, stating date of birth, qualifications with dates, and previous appointments held, with copies of 3 testimonials, should be sent to the undersigned not later than 29th October.

THOMAS BROWN, House Governor.

London Chest Hospital, E.2.

LONDON HOSPITAL, Whitechapel, E.1. Applications are invited for the post of REGISTRAR to the Department of Venereal Diseases.

Applications (12 copies), giving full particulars and the names and addresses of 3 referees, should be received by the undersigned by 12th November, 1956. H. BRIERLEY, House Governor.

LONDON HOSPITAL, Whitechapel, E.1. Applications are invited for the post of REGISTRAR to the Neurological Department becoming vacant on 1st January, 1957. A higher qualification, although desirable, is not essential, but experience in general medicine is necessary.

Applications (12 copies), giving full particulars and the names and addresses of 3 referees, should be received by the undersigned by 12th November, 1956. H. BRIERLEY, House Governor.

PADDINGTON GREEN CHILDREN'S HOSPITAL, W.2. (ST. MARY'S HOSPITAL.) Applications are invited for the posts of :—

(*a*) HOUSE SURGEON (pre-registration post) vacant 1st December, 1956. Tenable for 6 months.
(*b*) HOUSE PHYSICIAN (pre-registration post), vacant 1st December, 1956. Tenable for 6 months.

Applications, stating age, nationality, qualifications with dates, and experience, with copies of 3 recent testimonials, should reach the Secretary not later than Saturday, 3rd November, 1956.

POPLAR HOSPITAL, East India Dock-road, E.14. (120 Beds.) HOUSE SURGEON (pre-registration post). Duties include inpatient and outpatient work. Recognised for F.R.C.S. Vacant 1st December, 1956.

Applications, stating age, nationality and qualifications, to the Hospital Secretary.

PRINCE OF WALES'S GENERAL HOSPITAL, N.15. (248 Beds.) Applications are invited from qualified medical practitioners for appointment as RESIDENT JUNIOR HOUSE SURGEON for casualty (pre-registration first or second post) for a period of 6 months, vacant 1st December, 1956.

Application form from Secretary, Tottenham Group Hospital Management Committee (Group 4), The Green, N.15, to be returned by 10th November, 1956.

PRINCE OF WALES'S GENERAL HOSPITAL, N.15. (248 Beds.) Applications are invited from registered medical practitioners for appointment as HONORARY CLINICAL ASSISTANTS to all Medical, Surgical, and other Special Outpatient Departments of The Prince of Wales's General Hospital for a period of 1 year commencing 1st January, 1957.

Applications to Group Secretary, Tottenham Group Hospital Management Committee (Group 4), The Green, N.15, stating qualifications and experience, &c., by 3rd November, 1956.

ROYAL FREE HOSPITAL. Applications are invited for the post of REGISTRAR to the X-ray Department of the Royal Free Hospital. The post is non-resident, for 1 year in the first instance. Duties to commence as soon as possible. Candidates should be registered medical practitioners of not more than 10 years standing and should hold the D.M.R.(D.).

Formal applications, giving details of experience, &c., together with 3 testimonials, should be sent to the Secretary, Royal Free Hospital, Gray's Inn-road, W.C.1, not later than 12th November, 1956.

ROYAL FREE HOSPITAL. Applications are invited from registered medical practitioners for the post of SENIOR CASUALTY OFFICER at the Royal Free Hospital, Gray's Inn-road, W.C.1. The appointment is full-time, resident, for 6 months; duties to commence 1st January, 1957. Salary and conditions of service in accordance with those laid down by the Ministry of Health for Senior House Officers.

Application forms may be obtained from the Secretary, Royal Free Hospital, Gray's Inn-road, W.C.1, to whom they should be returned not later than 20th November, 1956.

ROYAL FREE HOSPITAL. Applications are invited from registered medical practitioners for the post of SENIOR HOUSE OFFICER (E.N.T. Department of the Royal Free Hospital). The appointment is full-time, non-resident, for 6 months, with possibility of reappointment. Salary and conditions of service in accordance with the scale laid down by the Ministry of Health for Senior House Officers. Duties to commence 1st December, 1956.

Application forms may be obtained from the Secretary, Royal Free Hospital, Gray's Inn-road, W.C.1, to whom they should be returned not later than 10th November, 1956.

ROYAL FREE HOSPITAL GROUP. Applications are invited for the post of RESIDENT PATHOLOGIST (House Officer), vacant 1st December, 1956, from registered Men and Women practitioners. The post is for 6 months, renewable for a further 6 months. Salary and conditions of service in accordance with the scale laid down by the Ministry of Health for House Officers.

Application forms may be obtained from the Secretary, Royal Free Hospital, Grays Inn-road, W.C.1, to whom they should be returned not later than 10th November, 1956.

ROYAL FREE HOSPITAL GROUP. Applications are invited from registered Men and Women medical practitioners for the post of RESIDENT SENIOR HOUSE OFFICER in Pathology for work at the Royal Free Hospital and within the Group. Previous experience in a pathology appointment is desirable. The appointment is for 6 months in the first instance, subject to reappointment for a further 6 months; duties to commence 1st January, 1957. Salary and conditions of service in accordance with the scale laid down by the Ministry of Health for Senior House Officers.

Application forms may be obtained from the Secretary, Royal Free Hospital, Gray's Inn-road, W.C.1, to whom they should be returned not later than 20th November, 1956.

ROYAL FREE HOSPITAL GROUP. Applications are invited for the following MEDICAL REGISTRAR posts in the Royal Free Hospital Group :—

(*a*) General Medicine, Gray's Inn-road.
(*b*) General Medicine, Lawn-road.
(*c*) General Medicine, at Lawn-road and Gray's Inn-road, including part-time duties in the Diabetic Department.

The above appointments are for 1 year in the first instance, duties to commence 1st January, 1957. Salary and conditions of service in accordance with the scales laid down by the Ministry of Health for Registrars.

Formal applications, giving details of qualifications and experience together with the names of 3 referees, should be made to the Secretary to the Board of Governors, Royal Free Hospital, Gray's Inn-road, W.C.1, not later than 25th November, 1956.

ROYAL FREE HOSPITAL GROUP. Applications are invited for the appointment of REGISTRAR (Women) to the Gynæcological and Obstetric Department of the Elizabeth Garrett Anderson Hospital, with some duties at the Hampstead General Hospital. Applicants must be registered medical practitioners of not more than 10 years qualification. The appointment is full-time, resident, for 1 year in the first instance, duties to commence 1st December, 1956. Salary and conditions of service in accordance with the scale laid down by the Ministry of Health.

Applications, with details of qualifications and experience, and giving the names of 3 referees, to be sent to the Secretary to the Board of Governors, Royal Free Hospital, Gray's Inn-road, not later than 17th November, 1956.

ROYAL MARSDEN HOSPITAL, Fulham-road, S.W.3. Applications are invited from registered medical practitioners for the 2 posts of HOUSE SURGEONS (resident). Salary £525 p.a. The posts are tenable for 6 months from 29th December, 1956, and 1st January, 1957, respectively.

Application forms are obtainable from the House Governor, to whom applications, together with copies of 3 recent testimonials, should be sent not later than Friday, 9th November, 1956.

ROYAL MARSDEN HOSPITAL, Fulham-road, S.W.3. Applications are invited for the post of RESIDENT SURGICAL OFFICER (Senior House Officer) to commence duty on 9th January, 1957. The appointment is for a period of 12 months. Preference will be given to Fellows of the Royal College of Surgeons.

Forms of application are obtainable from the House Governor, to whom applications, together with copies of 3 recent testimonials, should be sent not later than 13th November, 1956.

ROYAL NATIONAL THROAT, NOSE AND EAR HOSPITAL, Gray's Inn-road, W.C.1, and Golden-square, W.1. RESIDENT HOUSE SURGEON (post-registration post). Applications are invited for a 6 months appointment as from 8th December, 1956, with salary and conditions as laid down for House Officers in the terms and conditions of service in the National Health Service.

Applications, stating age, qualifications, full details of previous experience (particularly in this specialty), with copies of 1–3 recent testimonials, should be sent to the House Governor without delay.

ROYAL NORTHERN HOSPITAL, Holloway, London, N.7. HOUSE PHYSICIAN (post or pre-registration) required early January.

Applications, with copies of recent testimonials, to be sent to the Hospital Secretary by 30th October, 1956.

ST. BARTHOLOMEW'S HOSPITAL, E.C.1, AND NORTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the post of SENIOR REGISTRAR in Anæsthetics tenable for a period of 4 years from 1st January, 1957, or by arrangement. The first year of service will be spent at St. Bartholomew's Hospital and the second year at either Chase Farm Hospital, Enfield, or the Prince of Wales Hospital, Tottenham. The programme for the third and fourth years will be by arrangement between the hospitals mentioned. Candidates must be in possession of the F.F.A.R.C.S.

Applications (12 copies), together with the names of 3 referees, should be submitted to the undersigned within the next 14 days.

C. C. CARUS-WILSON, Clerk to the Governors.

St. Bartholomew's Hospital, West Smithfield, E.C.1.

ST. CHARLES' HOSPITAL, Ladbroke-grove, W.10. (581 Beds.) Applications are invited for the post of HOUSE PHYSICIAN (pædiatrics).

Applications, stating age, qualifications, experience, together with names and addresses of 2 referees, to be forwarded to Hospital Secretary immediately.

ST. GEORGE'S HOSPITAL, S.W.1. Applications are invited for the post of Part-time REGISTRAR (approximately half-time) to the Department of Dermatology. The appointment will be for 1 year in the first instance and the successful candidate will be required to take up duty as soon as possible after 1st December, 1956.

Applications, stating age, education, qualifications, experience, and the names of 2 referees, should reach the undersigned not later than 17th November, 1956.

P. H. CONSTABLE, House Governor.

ST. GEORGE'S HOSPITAL, S.W.1. Applications are invited for the post of HOUSE PHYSICIAN (resident) at the Victoria Hospital for Children, Tite-street, S.W.3, for 6 months with effect from 1st January, 1957. Applicants should have held at least 1 post as House Officer.

Applications, stating age, education, qualifications, experience and the names of 2 referees, should reach the undersigned not later than 10th November, 1956.

P. H. CONSTABLE House Governor.

St. George's Hospital.

ST. GEORGE'S HOSPITAL, S.W.1. Applications are invited for the post of RESIDENT ANÆSTHETIST in the grade of House Officer to St. George's Hospital. This is a post-registration appointment. The appointment will be for 6 months from 1st January, 1957, but the successful candidate will be required to take up duty on 18th December, 1956.

Applications, stating age, education, qualifications, and experience, should reach the undersigned not later than 10th November, 1956. P. H. CONSTABLE, House Governor.

ST. MARY'S HOSPITAL, Paddington, W.2. Applications are invited for the post of Whole-time REGISTRAR to the Obstetric and Gynæcological Department. The appointment is for a first period of 12 months with effect from 1st January, 1957; remuneration to be at Registrar rates. Preference will be given to candidates holding the M.R.C.O.G., or who have been accepted by the College for this examination.

Applications, stating nationality, date of birth, permanent address, qualifications with dates and details and National Health Service gradings of previous and present appointments, together with the names and addresses of 3 referees, should reach ALAN POWDITCH, House Governor, not later than 7th November, 1956.

ST. MARY'S HOSPITAL, W.2. Applications are invited for the post of Whole-time SENIOR REGISTRAR (non-resident) to the Obstetric and Gynæcological Department, tenable for 4 years from 1st January, 1957. The duties will include attendance at Obstetric and Gynæcological Clinics held at St. Mary's Hospital and the Samaritan Hospital for Women, also emergency calls by rota. Candidates must hold the M.R.C.O.G. and have had suitable experience.

Applications, stating nationality, date of birth, present address, qualifications with dates, details and National Health Service gradings of previous and present appointments, together with the names and addresses of 3 referees, should reach ALAN POWDITCH, House Governor, by 7th November, 1956.

ST. MARY'S HOSPITAL, W.2. Applications are invited for the post of RESIDENT HOUSE PHYSICIAN to the Neurological, Dermatological and Venereological Departments, for which either pre-registration interns seeking their second House Officer appointment, or post-registration candidates are eligible to apply. The appointment is for a period of 6 months with effect from 1st December, 1956.

Applications, stating nationality, date of birth, permanent address, qualifications with dates, and details and National Health Service gradings of previous and present appointments, together with the names and addresses of 3 referees, should reach ALAN POWDITCH, House Governor, by 5th November, 1956.

ST. STEPHEN'S HOSPITAL, Chelsea, S.W.10. Pædiatric HOUSE PHYSICIAN (resident), vacancy beginning December.

Applications, naming 2 referees, to Medical Superintendent, within 14 days.

ST. STEPHEN'S HOSPITAL, Chelsea, S.W.10. House PHYSICIAN for duty in Rheumatism Unit. Resident. This post offers valuable experience in general medicine and specialised experience in rheumatic and connective tissue diseases. Vacancy 17th December, 1956.

Applications, naming 2 referees, to be sent to Medical Superintendent within 14 days.

ST. TERESA'S MATERNITY HOSPITAL, The Downs, Wimbledon, S.W.20. (58 Beds.) Applications are invited for the appointment of RESIDENT OBSTETRIC HOUSE OFFICER for 6 months in the first instance, commencing on 8th December. Salary £425–£745, according to experience. Emoluments deducted according to usual scale. Self-contained flat available in the Hospital grounds. This post is ideal for those studying for higher degrees.

Applications, stating age, qualifications, nationality and experience, to the Medical Secretary.

ST. THOMAS'S HOSPITAL, London, S.E.1. Senior REGISTRAR to the Department of Anæsthetics. Whole-time, for a period of 1 year in the first instance.

Applications, naming 2 referees, to the Clerk of the Governors by 10th November, 1956.

ST. THOMAS'S HOSPITAL, London, S.E.1. Registrar to the Orthopædic Department, whole-time, for a period of 1 year from 1st January, 1957.

Applications, naming 2 referees, to the Clerk of the Governors, by 6th November, 1956.

ST. THOMAS'S HOSPITAL, London, S.E.1. Senior REGISTRAR to the X-ray Diagnostic Department, whole-time, for a period of 1 year in the first instance.

Applications, naming 2 referees, to the Clerk of the Governors by 9th November, 1956.

WEST LONDON HOSPITAL, Hammersmith-road, W.6. Whole-time NON-RESIDENT REGISTRAR (orthopædics) required as soon as possible.

Applications, stating age, qualifications, experience, names of 2 referees, to Secretary, Board of Governors, The Hammersmith, West London, and St. Mark's Hospitals, Ducane-road, W.12, by 3rd November.

WHIPPS CROSS HOSPITAL, London, E.11. Applications are invited for the post of HOUSE PHYSICIAN (pre-registration) in the Pædiatric Department. Post recognised for the D.C.H., vacant 1st December.

Application forms from the Hospital Secretary to be returned by 5th November, 1956.

ST. PETER'S, ST. PAUL'S, AND ST. PHILIP'S HOSPITALS. RESIDENT SURGICAL OFFICER (Senior Registrar grade) required for St. Paul's Hospital on 1st December, 1956. Applications invited from Male candidates on the British register who have completed their training in general surgery. Appointment for 6 months, with opportunity for a further 6 months if recommended. Candidates should be prepared to spend 1 year at the Hospital if required.

Applications (12 copies), and the names of 3 referees, should reach the House Governor, St. Peter's Hospital, Henrietta-street, W.C.2, by 10th November, 1956.

WESTMINSTER HOSPITAL, St. John's-gardens, S.W.1. Applications invited for post of SENIOR HOUSE OFFICER to Anæsthetics Department for 1 year from 1st January, 1957. Previous experience of anæsthetics not required, but preference given to candidates with 18 months experience in general medicine and surgery.

Applications (8 copies), with names of 2 referees, to House Governor by 10th November.

ASHFORD HOSPITAL, Ashford, Middlesex. (560 Beds.) STAINES GROUP HOSPITAL MANAGEMENT COMMITTEE. Required, RESIDENT HOUSE OFFICER (Male) for Special Departments (E.N.T., paedi..tric, dermatology, &c.). 6 months appointment. Not suitable for pre-registration candidates; offers good experience before general practice.

Applications, stating age, qualifications and experience, with copies of up to 3 recent testimonials, to Medical Director of Hospital immediate y.

ASHFORD HOSPITAL, Ashford, Middlesex. (560 Beds.) STAINES GROUP HOSPITAL MANAGEMENT COMMITTEE. Required, RESIDENT HOUSE OFFICER (Male) for general surgical and medical duties. 6 months appointment, not suitable for pre-registration candidates.

Applications, stating age, qualifications, and experience, with copies of up to 3 recent testimonials, to Medical Director of Hospital immedi ately.

AYLESBURY, BUCKINGHAMSHIRE. STOKE MANDEVILLE HOSPITAL. HOUSE SURGEON for Gynæcology Department. Post recognised for M.R.C.O.G. Vacant 18th November, 1956.

Applications from registered practitioners, with 2 testimonials, to the Administrative Officer as soon as possible.

BARNSTAPLE. NORTH DEVON INFIRMARY. (Central Group Hospital of 105 Beds.) SENIOR HOUSE SURGEON post vacant from 1st January, 1957, for 1 year. Salary £745 p.a. (5-roomed furnished flat available for rental.)

Applications, with customary details, to Group Secretary, North Devon Hospital Management Committee, 19, Alexandra-road, Barnstaple.

BEDFORD (near). BROMHAM HOSPITAL. (434 Beds for mental defectives and 60 at Annexe near Sandy.) REGISTRAR in Psychiatry required (resident). Hospital may be visited by direct appointment with the Medical Superintendent (phone: Oakley 295).

Application forms obtainable from, and returnable to, Secretary, Bedford Group Hospital Management Committee, 3, Kimbolton-road, Bedford.

BEDFORD GENERAL HOSPITAL. (439 Beds.) House SURGEON (mainly orthopædic). Pre- or post-registration; recognised for F.R.C.S. Required immediately. Post offers exceptional opportunities for general experience in busy acute surgical units.

Inquiries and applications, with copies of 2 recent testimonials, to Group Secretary, 3, Kimbolton-road, Bedford.

BEDFORD GENERAL HOSPITAL. (439 Beds.) 2 Resident Pre-registration HOUSE PHYSICIANS required, 1 mid-November and 1 end November.

Applications, stating age, qualifications, experience, copies of 2 recent testimonials, to Group Secretary, Bedford Group Hospital Management Committee, 3, Kimbolton-road, Bedford.

BRAINTREE. BLACK NOTLEY HOSPITAL. (536 Beds.) Applications invited for post of SENIOR HOUSE OFFICER for Non-pulmonary Tuberculosis Unit of approximately 120 Beds, particularly for skeletal and renal tuberculosis. Recognised for F.R.C.S.

Applications, with copies of 3 testimonials, to Group Secretary. Colchester Hospital Management Committee, 14, Pope's-lane, Colchester, Essex.

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS. Applications are invited for the post of RESIDENT OBSTETRIC AND GYNÆCOLOGICAL REGISTRAR for duties at the Queen Elizabeth Hospital and The Birmingham and Midland Hospital for Women (Professorial Unit) to commence 1st March, 1957.

Forms of application with details of appointment may be obtained from, and should be returned not later than 30th November, 1956, to, the House Governor, Birmingham and Midland Hospitals for Women, Showell Green-lane, Birmingham, 11. G. A. PHALP, Secretary.

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS. THE BIRMINGHAM AND MIDLAND HOSPITAL FOR WOMEN, Showell Green-lane, SPARKHILL, BIRMINGHAM, 11. RESIDENT GYNÆCOLOGICAL HOUSE SURGEON required for 7th January, 1957.

Application forms obtainable from the House Governor, to be returned 5th November, 1956.

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS. THE CHILDREN'S HOSPITAL, Ladywood-road, BIRMINGHAM, 16. Applications are invited for the post of Locum Tenens MEDICAL REGISTRAR or SENIOR HOUSE OFFICER for the period 1st December, 1956–30th June, 1957. Preference given to applicants with M.R.C.P. Normally non-resident but residence might be available.

Application forms obtainable from the House Governor and should be returned by 3rd November, 1956.

G. A. PHALP, Secretary to the Board of Governors.

BIRMINGHAM REGIONAL HOSPITAL BOARD.

(1) **Stoke-on-Trent Group, Princes-road, Stoke-on-Trent**

REGISTRAR (orthopædics) for Biddulph Grange Orthopædic Hospital (104 children's beds), Resident. Considerable experience orthopædics and traumatic surgery available. Excellent facilities for study. Possibility of married accommodation.

(2) **Mid-Worcestershire Group, Birmingham-road, Bromsgrove**

REGISTRAR (general surgery) for Kidderminster General Hospital. Whole-time. Experience specialty essential. Post recognised for F.R.C.S. Resident.

Application forms from Group Secretaries to be returned by 5th November, 1956.

BIRMINGHAM, 15, ROYAL ORTHOPÆDIC HOSPITAL. (Recognised by Royal College of Surgeons. 336 Beds for long and short term orthopædic cases (non-traumatic) and extensive outpatient services.) SENIOR HOUSE OFFICER (registered medical practitioner preferably with orthopædic experience).

Applications, with testimonials or names of referees, to Administrator.

BIRMINGHAM AND MIDLAND EYE HOSPITAL, Church-street, BIRMINGHAM, 3. HOUSE SURGEON required. Appointment for 6 months, but renewable. Hospital carries resident staff of 5 and provides a 2-year course of instruction. Recognised for the D.O. (England) and F.R.C.S. (England) in Ophthalmology. Wide experience available in all branches, including surgery.

Detailed applications to Group Secretary, Dudley Road Hospital, Birmingham, 18.

BOURNEMOUTH. ROYAL VICTORIA HOSPITAL. (494 Beds). BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of SENIOR HOUSE OFFICER (resident) orthopædic and casualty combined. The post, which becomes vacant on 10th November, is recognised for the F.R.C.S. examination.

Applications to the Hospital Secretary.

BOURNEMOUTH. ROYAL VICTORIA HOSPITAL, Shelley-road, BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of RESIDENT SENIOR HOUSE OFFICER (anæsthetics). The post, which becomes vacant on 10th November, is recognised for the D.A. and F.F.A.R.C.S., and is tenable for 12 months. Experience with Thoracic Unit available.

Applications to the Hospital Secretary.

BRECHIN, ANGUS. STRACATHRO HOSPITAL. Applications are invited from medical practitioners of 2 years standing for the post of SENIOR HOUSE OFFICER to the area Geriatric Units at Stracathro Hospital and Brechin Infirmary. The Units comprising some 140 Beds, undertake active treatment and rehabilitation under the direction of the Regional Consultant in Geriatrics. Salary scale £745 p.a., less £150 for residential emoluments.

Applications, accompanied by 3 recent testimonials or naming 3 referees, should be addressed to the Group Medical Superintendent at Stracathro Hospital.

BRIGHTON GENERAL HOSPITAL. Applications are invited for the appointment of HOUSE SURGEON (orthopædics) to the Orthopædic Unit. Salary in accordance with National scale. Vacant 4th December, 1956. This post is recognised, as a pre-registration appointment.

Applications, stating age, qualifications, and experience together with copies of recent testimonials, should be sent to the Physician-Superintendent, Brighton General Hospital, Elm-grove, Brighton.

BRIGHTON. NEW SUSSEX HOSPITAL FOR WOMEN, Windlesham-road, BRIGHTON. Vacancy for HOUSE PHYSICIAN (Female) for 6 months commencing 1st December, 1956. Includes duties in Gynæcological Department. Open to pre-registration candidates.

Applications, stating age, nationality, qualifications, and experience, with copies of 3 testimonials and/or names of referees, to be sent to the Administrative Officer as soon as possible.

BRIGHTON. ROYAL SUSSEX COUNTY HOSPITAL. (312 Beds.) 2 HOUSE SURGEONS required mid- and end-October. Recognised for pre-registration and F.R.C.S.

Applications, stating usual particulars, and naming 2 referees, to the Administrative Officer, Royal Sussex County Hospital, Brighton, 7.

BURNLEY AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (anæsthetics). The post offers good all-round experience under Consultant staff and recognised for the Diploma in Anæsthetics. Resident accommodation is available.

Applications, with 2 references, to the Group Secretary, Burnley General Hospital.

BURTON UPON TRENT GENERAL HOSPITAL. JUNIOR HOSPITAL MEDICAL OFFICER (orthopædic) required at the above Hospital. Duties include supervision of Casualty House Officer. Married quarters available.

Applications to Group Secretary.

BURY AND ROSSENDALE HOSPITAL MANAGEMENT COMMITTEE. FAIRFIELD GENERAL HOSPITAL. Applications are invited for the post of SENIOR HOUSE OFFICER (gynæcology and obstetrics).

Apply, stating age, qualifications and experience, together with names of 2 referees, to H. WILKINSON, Group Secretary.

Bury General Hospital, Bury, Lancs.

CHESTER. DEVA MENTAL HOSPITAL, Liverpool-road, CHESTER. JUNIOR HOSPITAL MEDICAL OFFICER required. Salary scale £775–£50–£1075 p.a. Single residential accommodation available. All forms of modern treatment given and psychiatric outpatient clinics staffed at local general hospitals. Study facilities.

Apply Medical Superintendent.

CARSHALTON, SURREY. QUEEN MARY'S HOSPITAL FOR CHILDREN. (General Children's Hospital of 818 Beds.) Whole-time ANÆSTHETIC REGISTRAR. The Surgery practice of the Hospital includes emergency, orthopædic, E.N.T., and general surgery, and there is a special Surgical Unit in association with the Hospital for Sick Children, Great Ormond-street. The post is recognised by the Faculty of Anæsthetists. Applicants are invited to visit the Hospital by appointment with he Physician-Superintendent.

Applications, on forms obtainable from the Group Secretary, should be submitted by 17th November, 1956.

CARSHALTON, SURREY. ST. HELIER HOSPITAL. OBSTETRIC HOUSE SURGEON to the Obstetric and Gynæcological Unit (108 Beds). Approved pre-registration post. Recognised for M.R.C.O.G.

Applications, stating age, experience and qualifications, with copies of recent testimonials, and the name and address of 1 referee, should be sent to the Secretary at above address.

CARSHALTON, SURREY. ST. HELIER HOSPITAL. HOUSE SURGEON (pre-registration post), General Surgery with duties in Genito-urinary. Vacant now.

Applications, giving age, qualifications, &c., with copies of recent testimonials and the names of referees, should be sent to Secretary at above address.

CHELMSFORD AND ESSEX HOSPITAL. (162 Beds.) Applications invited from pre-registration candidates, or others, for the post of HOUSE SURGEON. Recognised for F.R.C.S. Tenable for 6 months from 22nd November. The successful candidate will have the option of proceeding immediately to the post of House Phys c an for a further period of 6 months.

Applications, together with 2 recent testimonials, to the Secretary, Chelmsford Hospital Management Committee, London-road, Chelmsford.

CHELMSFORD. ST. JOHN'S HOSPITAL. House Surgeon (pre-registration, first or second post). Duties commence 16th November, 1956. The Hospital deals with a large number of routine and emergency cases. The post is recognised for training for the F.R.C.S.

Applications, stating age, nationality, qualifications and experience, toge her with copies of recent testimonials, should be received not later than 30th October, 1956 by the Secretary, Chelmsford Group Hospital Management Committee, Chelmsford and Essex Hospital, London-road Chelmsford.

CHERTSEY, SURREY. ST. PETER'S HOSPITAL (late Botleys Park War Hospital). (430 Beds.) ORTHOPÆDIC HOUSE SURGEON required from 3rd November, 1956. 100 orthopædic beds. Senior House Officer or House Officer (intern grade). Post recognised for F.R.C.S. and Pre-registration Service. Preference given to provisionally registered candidates. Salary in accordance with terms and conditions of National Health Service.

Applications, together with names and addresses of referees, to be sent to the Physician-Superintendent, St. Peter's Hospital, Chertsey, as soon as possible.

CHESTERFIELD ROYAL HOSPITAL. Senior House OFFICER required immediately at above Hospital for Accident and Orthopædic Department. Post recognised for F.R.C.S. training and offers valuable experience. National salary and conditions.

Apply M. H. BOONE, Secretary, Chesterfield Hospital Management Committee.

CHESTERFIELD ROYAL HOSPITAL. (281 Beds.) RESIDENT HOUSE SURGEON required 28th October. Pre-registration post, recognised for F.R.C.S.

Apply Group Secretary.

COULSDON, SURREY. NETHERNE HOSPITAL. Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER. All modern forms of treatment carried out in this Hospital of 2000 Beds which is recognised for the D.P.M. The Physician-Superintendent will give further information or arrange for the Hospital to be visited.

Apply for application forms from Secretary without delay.

COULSDON, SURREY. NETHERNE HOSPITAL. Applications are invited for the post of Locum REGISTRAR. All modern forms of treatment carried out in this Hospital of 2000 Beds which is recognised for the D.P.M. The Physician-Superintendent will give further information or arrange for the Hospital to be visited.

Apply for application forms from Secretary without delay.

COULSDON, SURREY. NETHERNE HOSPITAL. Applications are invited for the post of SENIOR HOUSE OFFICER. All modern forms of treatment carried out in this Hospital of 2000 Beds which is recognised for the D.P.M. The Physician-Superintendent will give further information or arrange for the Hospital to be visited.

Apply for application forms from Secretary without delay.

CROYDON GENERAL HOSPITAL. House Surgeon (pre-registration) required as from 10th November, 1956. Post recognised for F.R.C.S.

Application forms obtainable from GEORGE A. PAINES, Group Secretary, Hospital Management Committee, General Hospital, London-road, Croydon, to be returned immediately.

CROYDON. GENERAL HOSPITAL. (200 Beds.) Croydon GROUP HOSPITAL MANAGEMENT COMMITTEE. HOUSE PHYSICIAN (pre-registration) required from 5th December, 1956.

Application forms obtainable from GEORGE A. PAINES, Secretary, Hospital Management Committee, General Hospital, London-road, Croydon.

CROYDON. MAYDAY HOSPITAL. (611 Beds.) Croydon GROUP HOSPITAL MANAGEMENT COMMITTEE. HOUSE SURGEON (pre-registration) required from 20th November, 1956. Post recognised for F.R.C.S. examination.

Application forms obtainable from GEORGE A. PAINES, Secretary, Hospital Management Committee, General Hospital, London-road, Croydon.

CHICHESTER. ROYAL WEST SUSSEX HOSPITAL. (202 acute beds.) RESIDENT HOUSE PHYSICIAN required for 6 months appointment. National salary scale for first, second, or third posts. Post approved for pre-registration practitioners. 7 residents including Resident Medical Officer and House Physician. Vacant 12th November, 1956.

Applications, stating age, experience, qualifications, with references or names of referees, to Senior Administrative Officer.

CREWE AND DISTRICT MEMORIAL HOSPITAL. REGISTRAR (Casualty and Orthopædic Department) required. Duties include casualty work at the Hospital, as well as orthopædics. Modern Theatres and Casualty Department almost ready for occupation. Salary and conditions as per regulations.

Applications, stating age, qualifications, and experience, together with names of 3 referees, to Group Secretary, South Cheshire Hospital Management Committee, Barony Hospital, Nantwich.

DERBY. DERBYSHIRE HOSPITAL FOR SICK CHILDREN. (86 Beds. Recognised for training for the D.C.H.) SHEFFIELD REGIONAL HOSPITAL BOARD. RESIDENT or NON-RESIDENT REGISTRAR (pædiatrics) required. The post is based upon the Derbyshire Hospital for Sick Children but includes duties at other hospitals in the Group. Appointment for 1 year in the first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 5th November, 1956, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

DERBY. DERBYSHIRE ROYAL INFIRMARY. Senior HOUSE OFFICER (casualty), vacant 24th November, 1956. Recognised for F.R.C.S.

Apply, stating full details with copies of 2 recent testimonials, to Secretary.

DERBY. DERBYSHIRE ROYAL INFIRMARY. House SURGEON (general surgery). Pre-registration candidates eligible. Vacant 19th November, 1956.

Apply, stating details with copies of 2 testimonials, to Secretary.

DOUGLAS, ISLE OF MAN. NOBLE'S ISLE OF MAN HOSPITAL. (160 Beds.) Applications are invited from registered medical practitioners with previous hospital experience, preferably at a teaching hospital, for the post of SENIOR HOUSE SURGEON at this busy General Hospital. The Senior of 4 House Officer posts. The post becomes vacant mid-November, and is suitable for candidate seeking further clinical experience and opportunity for reading for higher qualification. Recognised for F.R.C.S. Salary £745 p.a. with a deduction of £125 p.a. for board, lodging, &c., if resident.

Applications, giving relevant particulars, and copies of 2 recent testimonials, or names and addresses of 2 referees, should be forwarded to the Secretary, Noble's Isle of Man Hospital, Douglas.

DRIFFIELD, YORKSHIRE. EAST RIDING GENERAL HOSPITAL. (247 Beds.) SENIOR HOUSE PHYSICIAN, vacant now. Salary £745, less emoluments. Duties to include acute and chronic medicine.

Detailed applications, with references, to the Group Secretary, Westwood Hospital, Beverley, Yorkshire.

DRIFFIELD, YORKSHIRE. NORTHFIELD SANATORIUM. (78 Beds.) SENIOR HOUSE PHYSICIAN, vacant now. Offers experience all branches of tuberculosis within Group, including surgery, M.M.R., and clinics. Time for study. Ex-patients welcome. £150 for full residence.

Applications to Group Secretary, Westwood Hospital, Beverley, Yorkshire.

EAST ANGLIAN REGIONAL HOSPITAL BOARD. SURGICAL REGISTRAR, Great Yarmouth and Gorleston Hospital (Norfolk and Norwich Group). Post recognised for F.R.C.S. Appointment for 1 year, renewable for second year.

Applications, stating age, experience and the names of 3 referees, to the Board's Senior Administrative Medical Officer, 117, Chesterton-road, Cambridge, by 5th November, 1956. Candidates invited to visit Hospital by direct arrangement with the Hospital Secretary.

EDGWARE GENERAL HOSPITAL, Edgware, Middlesex. (715 Beds.) RESIDENT HOUSE SURGEON (general and genito-urinary surgery) for above Hospital. Post vacant 29th November, 1956. 6 months appointment. Recognised for F.R.C.S. and pre-registration purposes.

Applications, stating age, qualifications, experience and enclosing copies of up to 3 recent testimonials, to Medical Director of Hospital by 3rd November, 1956.

EPSOM, SURREY. WEST PARK HOSPITAL (for all stages of nervous and mental disorders). WEST PARK HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of a REGISTRAR in Psychiatry at above Hospital. Candidates may be of either sex. Single residential quarters available. All modern methods are practised and there are facilities for study for the D.P.M. Within easy reach of London.

Applications (5 copies) should be made on forms obtainable from the Secretary to the Hospital Management Committee at the Hospital, to whom they should be returned not later than 6th November, 1956.

EPSOM DISTRICT HOSPITAL, Dorking-road, Epsom, SURREY. RESIDENT HOUSE PHYSICIAN required 6th December. Pre-registration post.

Applications, stating age, qualifications, and experience with copies of 2 recent testimonials, should be sent as soon as possible to Group Secretary at above address.

EPSOM DISTRICT HOSPITAL, Dorking-road, Epsom, SURREY. RESIDENT HOUSE SURGEON required 11th December. Pre-registration post, recognised for F.R.C.S.

Applications, stating age, qualifications, and experience with copies of 2 recent testimonials, should be sent as soon as possible to Group Secretary at above address.

ENFIELD, MIDDLESEX. CHASE FARM HOSPITAL. Appointment of RESIDENT HOUSE SURGEON (third post), vacant 30th December, 1956. Post provides experience and duties in both general surgery and orthopædics. 6 months appointment. Post recognised for F.R.C.S. by the Royal College of Surgeons.

Applications, with the names and addresses of 2 referees, to the Group Secretary, Enfield Group Hospital Management Committee.

GLASGOW, S.W.1. DAVID ELDER INFIRMARY. (50 gynæcological beds.) JUNIOR HOUSE OFFICER required for 6 months commencing 1st February, 1957. Post recognised as pre-registration appointment. Recognised for M.R.C.O.G.

Applications, in writing, to Medical Superintendent, Southern General Hospital, Glasgow, S.W.1.

GRIMSBY. GENERAL HOSPITAL. (Recognised for training for F.F.A.R.C.S.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time NON-RESIDENT or RESIDENT (single accommodation only) REGISTRAR (anæsthetics) required. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 5th November, 1956, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

GUILDFORD. ROYAL SURREY COUNTY HOSPITAL. (233 Beds.) RESIDENT HOUSE PHYSICIAN required from 17th November. Post is tenable for 6 months and is recognised for pre-registration candidates.

Applications, with copies of 3 testimonials, should be sent to the Hospital Secretary as soon as possible.

HASTINGS. ROYAL EAST SUSSEX HOSPITAL. (150 Beds.) Applications are invited for the post of HOUSE SURGEON (general surgery and orthopædics), vacant early November.

Applications by 31st October to Hospital Administrator.

HAVERFORDWEST. PEMBROKE COUNTY WAR MEMORIAL HOSPITAL. (163 Beds.) WEST WALES HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER (surgical (Locum)) now vacant until the end of January, 1957. Salary and conditions of service as laid down by the Ministry of Health.

Applications, stating age, qualifications, experience, and nationality, with names and addresses of 3 referees, to the Group Secretary, West Wales Hospital Management Committee, Glangwili, Carmarthen.

HEMEL HEMPSTEAD, HERTFORDSHIRE. WEST HERTS HOSPITAL. HOUSE PHYSICIAN (pre-registration) required.

Applications, giving full details and 2 names for reference, should be sent to the Hospital Secretary.

HERTFORD COUNTY HOSPITAL. (171 Beds. Hospital situated 21 miles from London.) Applications are invited for appointment of RESIDENT HOUSE PHYSICIAN (Male or Female), second post held. Recognised pre-registration post. 6 months appointment. Preference given to applicants who have held resident surgical or medical posts in general hospital. Duties to commence 3rd December, 1956.

Applications to Group Secretary, Hertford Hospital Management Committee, County Hospital, Hertford, Herts.

HUDDERSFIELD HOSPITAL MANAGEMENT COM-MITTEE. Applications are invited from provisionally registered medical practitioners for the post of HOUSE SURGEON to the Princess Royal Maternity Home (57 Beds), to commence duty on 21st November, 1956. The holder of the post, which is recognised for the D.Obst.R.C.O.G., will have access to the abnormal maternity and gynæcological beds at The Royal Infirmary. The Department is under the control of 2 Consultant Obstetricians and Gynæcologists. Salary in accordance with National scale.

Applications to be addressed to—

H. J. JOHNSON,
Secretary to the Management Committee.

The Royal Infirmary, Huddersfield.

ILFORD. KING GEORGE HOSPITAL. There is a vacancy for a SENIOR HOUSE OFFICER ANÆSTHETIST at above Hospital. The Officer appointed will be required to be available for duty in other hospitals in the Group. Salary will be at the rate of £745 p.a., less £150 p.a. emoluments.

Applicants should have been registered not less than 1 year, and should send applications, accompanied by copies of 3 testimonials, to the undersigned within 7 days of the appearance of this advertisement.

H. F. HARRIS, Group Secretary,
Ilford and Barking Group Hospital Management Committee.
King George Hospital, Ilford.

IPSWICH AND EAST SUFFOLK HOSPITAL, Heath ROAD WING, IPSWICH. (274 Beds.) Applications invited for post of CASUALTY OFFICER (Senior House Officer grade), now vacant. The post, which is normally of 1 years duration, has day-time duties only, offering opportunity of study for higher examinations.

Detailed applications, together with 3 recent testimonials, to the Hospital Secretary.

IPSWICH AND EAST SUFFOLK HOSPITAL. Anglesea ROAD WING. (356 Beds.) Applications are invited for the post of HOUSE SURGEON to the Senior Consultant General Surgeon, vacant on 7th November, 1956. The post is recognised for pre-registration and for the F.R.C.S. examinations.

Applications, with copies of recent testimonials, to Hospital Secretary.

IPSWICH AND EAST SUFFOLK HOSPITAL, Anglesea ROAD WING. (356 Beds.) Applications are invited for the post of HOUSE PHYSICIAN, vacant on 19th November, 1956. Approved pre-registration post.

Applications, stating age, nationality and experience, together with copies of 3 recent testimonials, to reach the Hospital Secretary by 5th November, 1956.

IPSWICH AND EAST SUFFOLK HOSPITAL. Anglesea ROAD WING. Applications are invited for the post of SENIOR HOUSE OFFICER in General Medicine. The post offers excellent experience and opportunity for working for higher qualifications.

Applications, stating age, nationality and experience, together with copies of recent testimonials, to Hospital Secretary.

IPSWICH GROUP CHEST HOSPITALS. Senior House OFFICER for duties in the above Hospitals. Suitable for a doctor reading for higher qualifications with special interest in chest complaints. Will be required to reside alternately at Foxhall Hospital, Ipswich (102 Beds) for investigation and treatment of all chest diseases, where duties in the Major Surgical Unit will be involved, and Nayland (British Legion) Hospital, near Colchester (124 Beds for tuberculous and non-tuberculous pulmonary disease). Furnished quarters available.

Further details from Dr. G. R. MCNAB, Physician-Superintendent, Foxhall Hospital, Ipswich, to whom applications, with recent testimonials, should be sent.

LLANDUDNO GENERAL HOSPITAL, Llandudno. (Recognised for F.R.C.S.) Applications are invited for the post of HOUSE SURGEON at above Hospital. The appointment is for a period of 6 months. Salary and conditions of service in accordance with those approved by the Ministry of Health.

Applications, stating age, qualifications and experience, together with the names and addresses of 2 referees, to be forwarded to the Group Secretary, Caernarvon and Anglesey Hospital Management Committee, Plas Gwyn, Ffriddoedd-road, Bangor, within 10 days of the appearance of this advertisement.

LEEDS. THE UNITED LEEDS HOSPITALS. Maternity HOSPITAL AT LEEDS. RESIDENT SURGICAL OFFICER of Registrar status required for 1 year in the first instance, from 1st January, 1957. Conditions of service for hospital medical staff apply.

Applications, stating age, qualifications, previous posts with dates, with 3 names for reference, should be sent to the Sub-Dean, School of Medicine, Leeds, 1, before 12th November, 1956.

LEEDS. THE UNITED LEEDS HOSPITALS. The GENERAL INFIRMARY AT LEEDS. REGISTRAR for E.N.T. Department required, for 1 year in the first instance, from 1st January, 1957. Terms and conditions of service for hospital medical staff apply.

Applications, stating age, qualifications, previous posts with dates, with 3 names for reference, should be sent to the Sub-Dean, School of Medicine, Leeds, 1, not later than 12th November, 1956.

LEEDS. THE UNITED LEEDS HOSPITALS. The GENERAL INFIRMARY AT LEEDS. RESIDENT MEDICAL OFFICER required at the Ida and Robert Arthington Hospital, Cookridge, Leeds. The Hospital is used as a pre-convalescent annexe to the Teaching Hospital and the holder of the post will also be required, on occasions, to deputise for the Resident Medical Officer at the General Infirmary at Leeds. The post is of Senior House Officer status and the salary is £745 p.a.

Applications, giving age, qualifications, posts held with dates, and 3 names for reference, should be sent to the Secretary to the Board, as soon as possible.

LEEDS REGIONAL HOSPITAL BOARD. Registrar vacancies.

Anæsthetics

Halifax Group (approximately 290 Beds) in the surgical specialties. Resident.

Chest Diseases

Leeds Chest Clinic and additional duties, as required, at Regional sanatoria. Previous experience in diseases of the chest desirable. Accommodation for a single person only at Killingbeck Hospital.

General Medicine

(i) Pontefract and Castleford Groups (65 general medical beds). Married accommodation available.

(ii) Harrogate General Hospital (253 Beds) (56 general medical beds) and at Knaresborough Hospital. Also some duties in pædiatrics (28 Beds). Non-resident. Furnished flat may be available.

General Surgery

(i) St. Luke's Hospital, Bradford (160 general surgical beds). Recognised for the F.R.C.S.

(ii) Bradford Royal Infirmary. 1 of 2 similar posts (90 general surgical beds) may be non-resident. Recognised for F.R.C.S.

Obstetrics and Gynæcology

(i) York A Group (80 obstetric and 75 gynæcological beds). Recognised for M.R.C.O.G.

(ii) Dewsbury, Batley and Mirfield Group. Resident. (Aggregate of 100 obstetric and 22 gynæcological beds.) Recognised for D.Obst.R.C.O.G.

(iii) Duties alternating (6 month periods) between St. Mary's Hospital, Leeds (110 obstetric beds) and St. James's Hospital, Leeds (75 obstetric and 52 gynæcological beds). Recognised for M.R.C.O.G.

Orthopædic Surgery

St. James's Hospital, Leeds (64 orthopædic beds) and the Public Dispensary, Leeds. Non-resident.

Psychiatry

(i) Two similar posts—Clifton Hospital, York (1100 Beds). Resident or non-resident.

(ii) Storthes Hall Hospital, Kirkburton, near Huddersfield (2680 Beds), and associated clinics. Accommodation for single person. In addition unfurnished flat for married person.

Facilities for attendance at Leeds University will be provided for the successful candidates who are studying for the D.P.M.

Radiotherapy

Regional Radium Institute, Bradford (50 Beds). Preferably resident. Unit provides a complete radiotherapy service for approximately 1,000,000 population.

Applications, stating age, qualifications, and details of present and previous appointments with dates, together with the names and addresses of 3 referees, to the Secretary, Joint Registrars Committee, Park-parade, Harrogate, by 8th November.

LEEDS REGIONAL HOSPITAL BOARD. Senior Registrar vacancies.

Chest Diseases

Castle Hill Sanatorium, Cottingham, near Hull (220 tuberculosis beds and 50 thoracic surgical beds). Non-resident.

Child Psychiatry

Person appointed will be under training at the Leeds University Department of Psychiatry and associated clinics and will have experience at the local authority Child Guidance Department and at a special school for maladjusted boys.

Applications, stating age, qualifications, and details of present and previous appointments with dates, together with the names and addresses of 3 referees, to the Secretary, Joint Registrars Committee, Park-parade, Harrogate, by 15th November, 1956.

MACCLESFIELD AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. HOUSE OFFICER in Surgery (pre-registration post). Acute Surgical Unit of 100 Beds. Recognised for F.R.C.S. purposes. Main casualty duties undertaken by Senior Resident Practitioner.

Apply immediately to Group Secretary, "Willerby House," Cumberland-street, Macclesfield.

MANCHESTER NORTHERN HOSPITAL. (Acute—116 Beds.) Applications are invited for the post of RESIDENT SURGICAL OFFICER (Registrar grade). Recognised for F.R.C.S.

Applications, with names of 2 referees, by 5th November, 1956, to Group Secretary, North Manchester Hospital Management Committee, Crumpsall Hospital, Manchester, 8.

MANCHESTER REGIONAL HOSPITAL BOARD. SALFORD HOSPITAL MANAGEMENT COMMITTEE. Applications invited for post of NON-RESIDENT REGISTRAR to the Neurosurgical Department at Salford Royal and the Royal Manchester Children's Hospitals. In addition to adult work the post offers exceptional opportunities for experience in pædiatric neurosurgery.

Applications also invited for post of RESIDENT REGISTRAR in Orthopædic Surgery in the above Group, main duties at Hope Hospital.

Applications, together with names and addresses of 2 referees, to be sent to the Group Secretary Salford Royal Hospital, Salford, 3, before 3rd November, 1956.

MANCHESTER. UNITED MANCHESTER HOSPITALS. MANCHESTER ROYAL EYE HOSPITAL. Applications are invited for the following posts :—

SENIOR HOUSE OFFICER.

HOUSE OFFICER (pre-registration surgical post).

Application forms may be obtained from the undersigned.

H. R. NORTH, General Superintendent.

Manchester Royal Eye Hospital.

MANCHESTER VICTORIA MEMORIAL JEWISH HOSPITAL. (Non-sectarian. Acute—105 Beds.) Applications are invited for the post of RESIDENT SURGICAL OFFICER (Registrar grade). Recognised for F.R.C.S. Vacant 5th January, 1957.

Applications, with names of 2 referees, by 5th November, 1956, to Group Secretary, North Manchester Hospital Management Committee, Crumpsall Hospital, Manchester, 8.

MANCHESTER. WEST MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. ECCLES AND PATRICROFT HOSPITAL. (General Hospital—48 Beds.) 1 SENIOR HOUSE OFFICER required. The work of the Hospital is mainly surgical and there is a busy Outpatient Department. Post vacant early November.

Forms from Secretary, Park Hospital, Davyhulme.

MANCHESTER. WEST MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. PARK HOSPITAL, DAVYHULME. (General Hospital—433 Beds.)

SENIOR HOUSE OFFICER (non-tuberculous thoracic surgery) required for Manchester Regional Hospital Board Centre. Post now vacant.

SENIOR HOUSE OFFICER (general medicine) required. Post vacant 1st January, 1957.

HOUSE PHYSICIAN (pædiatrics) required for mid-November. Post-registration. There is a Midwifery Unit of 73 Beds and a Pædiatric Unit which includes 10 thoracic surgical beds. Recognised for D.C.H.

Application forms from Group Secretary.

MANCHESTER, 20. WITHINGTON HOSPITAL. South MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the pre-registration post of HOUSE OFFICER (obstetrics), vacant immediately, at the above Hospital.

Applications, with full details, to be submitted to the Administrative Officer within 7 days of the appearance of this advertisement.

MANCHESTER, 23. WYTHENSHAWE HOSPITAL. SOUTH MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the post of CASUALTY OFFICER (Senior House Officer grade) at Wythenshawe Hospital. This post is recognised by the Royal College of Surgeons.

Applications, stating age, qualifications, present post, and names of 2 referees, to be forwarded to the Group Secretary, Withington Hospital, Manchester, 20, within 7 days of the appearance of this advertisement.

MARKET DRAYTON (near), SHROPSHIRE. CHESHIRE JOINT SANATORIUM. (305 Beds.) RESIDENT MEDICAL OFFICER (Junior Hospital Medical Officer or Senior House Officer according to experience). The post offers exceptional experience in the treatment of pulmonary tuberculosis.

Applications to the Medical Superintendent at the Sanatorium.

NOTTINGHAM. HIGHBURY HOSPITAL, Bulwell, NOTTINGHAM. LOCUM for Senior House Officer medical duties from 5th to 18th November, 1956. Opportunities to assist in Obstetrics Department.

Ring Secretary Telephone No. Nottingham 271275.

NEWARK GENERAL HOSPITAL. Nottingham No. 1 HOSPITAL MANAGEMENT COMMITTEE. 2 JUNIOR HOSPITAL MEDICAL OFFICERS (1 medical, 1 surgical) required for the above Hospital, situated on the Great North-road, approximately 20 miles from Nottingham. Post offers good experience. The Consultant staff attending Newark Hospital are on one or more of the Nottingham Hospitals. During next few months 2 flats will be available as married quarters but in the meantime single accommodation can be provided. Salary £775–£50–£1075. Duties to commence mid-December.

Applications, giving names of 3 referees, should be sent as soon as possible to the Group Secretary, Nottingham No. 1 Hospital Management Committee, General Hospital, Nottingham.

NEWCASTLE GENERAL HOSPITAL. (838 Beds.) NEWCASTLE UPON TYNE HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER required for Orthopædic Department.

Applications, together with names and addresses of 2 referees, should be sent to the Secretary, Newcastle General Hospital, Newcastle upon Tyne.

NEWCASTLE REGIONAL HOSPITAL BOARD.

REGISTRAR ORTHOPÆDIC SURGEON (whole-time), resident or non-resident, Darlington Group of hospitals. Single accommodation available.

REGISTRAR PATHOLOGIST (whole-time), non-resident, Hartlepools Group of hospitals. Furnished or unfurnished flat available. Applications will be considered from doctors who do not necessarily intend to specialise in pathology, but desire pathological experience for 1 or 2 years. The Central Laboratory, General Hospital, West Hartlepool, is in a new building and this appointment offers good experience in pathology as applied to clinical specialties and to general practice.

REGISTRAR PATHOLOGIST (whole-time), resident, North West Durham Group of hospitals. Single accommodation available.

REGISTRAR SURGEON (whole-time), general surgical Team No. 2, Tees-side Group of hospitals. Resident, or non-resident to reside in Middlesbrough. Single accommodation available. Post recognised for F.R.C.S.

REGISTRAR OBSTETRICIAN AND GYNÆCOLOGIST (whole-time), non-resident, Sunderland Group of hospitals. Post recognised for M.R.C.O.G.

REGISTRAR ORTHOPÆDIC SURGEON (whole-time), Durham Group of hospitals. Resident at County Hospital, Durham. Single accommodation available.

REGISTRAR PHYSICIAN (whole-time), 1 year only, Cardiovascular Unit, Newcastle General Hospital. Single accommodation available. Excellent experience afforded.

REGISTRAR PHYSICIAN (whole-time), Medical Clinic No. 2, Newcastle General Hospital. Single accommodation available.

SENIOR REGISTRAR RADIOLOGIST (whole-time), Gateshead Group of hospitals (Queen Elizabeth Hospital, 176 Beds : Bensham General 386 Beds). Single accommodation available.

Applications, with names and addresses of 3 referees, to Senior Administrative Medical Officer, Benfield-road, Newcastle upon Tyne, 6, within 14 days.

NEWMACHAR, ABERDEENSHIRE. KINGSEAT HOSPITAL. Applications are invited from Male or Female doctors for posts as REGISTRARS and SENIOR HOUSE OFFICERS in the above modern Mental Hospital of 820 Beds. 2 posts are available in each grade and residential accommodation is available if required. The Hospital is recognised for study for the D.P.M. and there is close association with the University Department of Mental Health. Posts would be tenable for 1 year in the first instance and National Health Service conditions apply. Until these appointments are filled applications for locum tenens posts will be considered.

Applications, with age, full details of experience, &c., and the names of 2 referees, should be lodged with the Secretary, Aberdeen Mental Hospitals, 62, Queen's-road, Aberdeen, within 14 days of this advertisement.

NEWMARKET GENERAL HOSPITAL, Suffolk. Applications are invited for the post, now vacant, of SENIOR HOUSE OFFICER, for orthopædic and casualty duties. The post is resident.

Applications, giving age, nationality and qualifications, together with 3 recent testimonials, should be sent to the Medical Superintendent.

NORTHAMPTON. ST. CRISPIN HOSPITAL, Duston, NORTHAMPTON. (1200 Beds.) SENIOR HOUSE OFFICER required. Salary according to national scale (£745 p.a.). Accommodation is available at the Hospital. The Hospital is approved for training for the D.P.M. of the Conjoint Board and the post offers excellent opportunities for participation in inpatient and outpatient work, E.E.G. investigations, and child psychiatry. There is a modern Admission Unit and an annual admission-rate of over 700 patients. Regular case conferences are held.

Applications, giving full details and names of 3 referees, to be sent to the Physician-Superintendent at the Hospital within 14 days.

OSWESTRY. ROBERT JONES AND AGNES HUNT ORTHOPÆDIC HOSPITAL. REGISTRAR in Orthopædics (resident/non-resident). Experience specialty and higher surgical qualification desirable.

Application forms from Secretary to be returned by 10th November, 1956. Candidates may visit Hospital.

OXFORD REGIONAL HOSPITAL BOARD. Registrar (whole-time) in Psychiatry, to St. Crispin Hospital, Duston, Northamptonshire. There is excellent opportunity to gain experience in adult and child psychiatry, inpatient and outpatient work, and E.E.G. Unit. Post recognised for D.P.M. Residential accommodation for married or single applicant.

Application forms, obtainable from the Secretary, Committee for Registrars, 43, Banbury-road, Oxford, should reach him by 30th October.

OXFORD REGIONAL HOSPITAL BOARD. Registrar (whole-time, non-resident) in Ophthalmology to the hospitals and clinics of the Aylesbury/High Wycombe area. The appointment will be for 1 year and eligible for extension to a second year.

Applications, on forms obtainable from the Secretary, Registrar Committee, 43, Banbury-road, Oxford, to reach him by 16th November, 1956.

OXFORD REGIONAL HOSPITAL BOARD. Applications are invited for the resident post of REGISTRAR in Anæsthetics to the hospitals of the Reading area. The appointment which is recognised for the F.F.A.R.C.S. Diploma, will be for 1 year and eligible for extension to 2 years. Single accommodation is available.

Applications, on forms obtainable from the Secretary, Registrar Committee, 43, Banbury-road, Oxford, should reach him by 10th November, 1956.

OXFORD REGIONAL HOSPITAL BOARD. Registrar in General Medicine (resident) to the hospitals of the Reading area. The appointment will be for 1 year and eligible for extension to 2 years. Single accommodation is available. The post will be available on 1st January, 1957.

Applications, on forms obtainable from the Secretary, Registrar Committee, 43, Banbury-road, Oxford, should reach him by 7th November, 1956.

OXFORD REGIONAL HOSPITAL BOARD. National SPINAL INJURIES CENTRE, STOKE MANDEVILLE HOSPITAL, AYLESBURY. Applications are invited for the post of REGISTRAR at this Centre. Experience in general surgery and medicine necessary. The post offers good experience in neurology, urology, physical medicine and rehabilitation. Full details of duties, &c., can be obtained from the Administrative Officer, Stoke Mandeville Hospital.

Applications, on forms obtainable from the Secretary, Registrar Committee, 43, Banbury-road, Oxford, should reach him by 16th November, 1956.

OXFORD. UNITED OXFORD HOSPITALS. Applications are invited for the post of REGISTRAR/RESEARCH ASSISTANT to the Accident Service of the Radcliffe Infirmary, from 1st January, 1957. The duties of this post will be divided equally between the clinical duties of the Registrar appointment, and research work in the Department, under the supervision of the Director of the Accident Service.

Applications, on forms obtainable from the Administrator, Radcliffe Infirmary, Oxford, should be received not later than 10th November, 1956.

OXFORD. UNITED OXFORD HOSPITALS. Applications are invited for the post of HOUSE SURGEON in the Accident Service of the Radcliffe Infirmary, to commence on 1st December for 6 months.

Applications, stating age, qualifications and experience, together with names of 2 referees, to Administrative Assistant, Radcliffe Infirmary, Oxford, should be received not later than 3rd November, 1956.

PLYMOUTH. THE SCOTT ISOLATION HOSPITAL. HOUSE PHYSICIAN (resident, Male), pre-registration, post vacant 20th November, 1956. Excellent experience, particularly for those entering General Practice.

Applications should be sent to the Group Secretary, Plymouth Special Hospital Management Committee, 8, Nelson-gardens, Stoke, Plymouth, Devon.

PLYMOUTH. SOUTH DEVON AND EAST CORNWALL HOSPITAL.

SENIOR HOUSE OFFICER in Surgery, vacant 15th November, 1956. Recognised for the F.R.C.S. Devonport Section.

HOUSE SURGEON (pre-registration post), vacant 1st January, 1957. Recognised for the F.R.C.S. Freedom Fields Section.

HOUSE PHYSICIANS (pre-registration posts), vacancies 1st and 17th January, 1957. Greenbank Road Section.

HOUSE SURGEONS (pre-registration posts), vacancies 1st December, 1956, 10th and 18th January, 1957. Recognised for the F.R.C.S. Greenbank Road Section.

Applications, stating age, nationality, qualifications and experience, together with the names and addresses of 3 referees, to be sent to—

ARTHUR R. CASH, Group Secretary, Plymouth,
South Devon and East Cornwall General Hospital Group.
7, Nelson-gardens, Stoke, Plymouth.

PLYMOUTH. SOUTH DEVON AND EAST CORNWALL HOSPITAL. CENTRAL CASUALTY DEPARTMENT. SENIOR HOUSE OFFICERS in Casualty, 2 vacancies on 1st January, 1957. Recognised for the F.R.C.S.

Applications, stating age, nationality, qualifications and experience, with names of 3 referees, to be sent to—

ARTHUR R. CASH, Group Secretary, Plymouth,
South Devon and East Cornwall General Hospital Group.
7, Nelson-gardens, Stoke, Plymouth.

PONTEFRACT GENERAL INFIRMARY. Resident CASUALTY OFFICER required. Graded Senior House Officer. Recognised for Fellowship. Married accommodation available.

Applications to the Secretary, Great Northern House, Salterrow, Pontefract, Yorkshire.

PORTSMOUTH GROUP HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the post of RESIDENT SURGICAL OFFICER (Registrar grade) with duties mainly at the Royal Portsmouth Hospital. Vacant 19th November. Recognised for the F.R.C.S.

Forms of application may be obtained from the Group Secretary, Saint Mary's Hospital, Milton-road, Portsmouth, which should be returned to him duly completed on or before 5th November. Candidates may visit the above Hospital by arrangement with the Group Secretary.

PORTSMOUTH GROUP HOSPITAL MANAGEMENT COMMITTEE.

Queen Alexandra Hospital (87 surgical beds)

HOUSE SURGEON (pre-registration post), vacant 20th November, 1956.

Applications, stating age, experience, and qualifications, together with names of 2 referees, should be forwarded as soon as possible to E. H. HURST.

St. Mary's Hospital, Milton-road, Portsmouth.

READING AND DISTRICT HOSPITAL MANAGE-MENT COMMITTEE. Applications are invited for the post of RESIDENT SENIOR HOUSE OFFICER (Area Accident and Orthopædic Department), vacant mid-December. Recognised for F.R.C.S. Duties including work in area Casualty Department at Battle Hospital, Reading (300 Beds). Person appointed will work with Registrar and House Officers.

Apply, stating nationality, present post and qualifications with dates, together with names of 2 referees, to Group Secretary, 3, Craven-road, Reading.

READING AREA DEPARTMENT OF MEDICINE. Applications are invited from registered and provisionally registered medical practitioners for 2 posts as RESIDENT HOUSE PHYSICIAN vacant on 1st December, 1956, for a period of 6 months. Successful applicants will be required to carry out duties at the following Reading Hospitals: Royal Berkshire (398 Beds), Battle (300 Beds) and Prospect Park (104 Beds).

Write, before 16th November, stating age, qualifications with dates, nationality, present post, with copy of a recent testimonial, to Secretary, Royal Berkshire Hospital, Reading.

READING. BATTLE HOSPITAL. (391 Beds.) Applications are invited from registered medical practitioners for the post of RESIDENT JUNIOR HOUSE SURGEON (orthopædic) in the Area Accident and Orthopædic Department. Post now vacant. F.R.C.S. recognised. Also casualty duties. Salary £425–£525 p.a., less £150 board-residence.

Apply, stating age, qualifications with dates, nationality, present post, with 1 copy of recent testimonial, to Hospital Secretary.

READING. ROYAL BERKSHIRE HOSPITAL. (398 Beds.) Applications are invited from provisionally registered medical practitioners, Male and Female, for resident post of HOUSE SURGEON, vacant 1st December, 1956, and tenable for 6 months.

Write, before 16th November, stating age, qualifications with dates, nationality, present post, with copy of 1 recent testimonial, to Secretary.

READING. ROYAL BERKSHIRE HOSPITAL. Applications are invited from registered medical practitioners only for the post of RESIDENT ASSISTANT PATHOLOGIST vacant 6th December and tenable for 6 months. Salary £525 p.a.

Write, stating age, qualifications with dates, nationality, present post, with copy of 1 recent testimonial, to Secretary.

READING. ROYAL BERKSHIRE HOSPITAL. (339 Beds.) Applications are invited from registered medical practitioners (Male or Female) for the appointment of a SENIOR HOUSE OFFICER (anæsthetics), vacant 1st January, 1957, for a period of 1 year. Post recognised for F.F.A.R.C.S. Salary £745 p.a., less £150 for board-residence.

Write, stating age, qualifications with dates, nationality and present post, together with the names of 3 referees, to the Group Secretary, Reading and District Hospital Management Committee, 3, Craven-road, Reading.

RICHMOND, SURREY. ROYAL HOSPITAL. (General Hospital—121 Beds.) Applications are invited for the following posts:—

Pre-registration HOUSE PHYSICIAN. Post vacant 19th November, 1956.

Pre-registration HOUSE SURGEON. Post vacant 4th December, 1956.

Applications immediately to Administrative Officer.

ROCHFORD, ESSEX. GENERAL HOSPITAL. Locum HOUSE SURGEON (registered or pre-registered) required for 2, or possibly 4, weeks from 2nd November, 1956.

Applications to be sent to the undersigned as soon as possible.

J. C. FIELD, Secretary.

ROMFORD, ESSEX. OLDCHURCH HOSPITAL. (722 Beds.) HOUSE SURGEON (resident) required from 14th November, 1956, in the Obstetric and Gynæcological Unit consisting of 96 obstetric beds and 52 gynæcological beds. Post is approved for pre-registration purposes and recognised for D.Obst. R.C.O.G., and M.R.C.O.G.

Apply to Group Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, within 7 days of the appearance of this advertisement.

ROMFORD, ESSEX. VICTORIA HOSPITAL. (99 Beds.) RESIDENT HOUSE PHYSICIAN (Male) required immediately. Post not approved for pre-registration purposes.

Applications should be forwarded to the Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford.

STARCROSS, DEVON. ROYAL WESTERN COUNTIES INSTITUTION HOSPITAL GROUP. Applications are invited for the appointment of JUNIOR HOSPITAL MEDICAL OFFICER (Male or Female), preferably with some knowledge of mental deficiency.

Applications, with full details of age, qualifications, and experience, together with names of 2 referees, should be submitted to the Medical Superintendent, Royal Western Counties Institution, Starcross, Devon.

STOKE-ON-TRENT. CITY GENERAL HOSPITAL. STOKE-ON-TRENT GROUP. Locum SENIOR HOUSE OFFICER (obstetrics and gynæcology) required for above Hospital. (100 maternity, 40 gynæcology beds.) Period 1st–28th November.

Apply Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT. HAYWOOD HOSPITAL. (96 Beds.) RESIDENT MEDICAL OFFICER (Junior Hospital Medical Officer) required. Combined duties on surgical and medical wards. Possibility of married accommodation.

Applications, with copy testimonials, to Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent, as soon as possible.

ST. ALBANS CITY HOSPITAL, St. Albans, Hertfordshire. (384 Beds.) HOUSE SURGEON (House Officer grade) required for general surgical team. Recognised for F.R.C.S. Post vacant 2nd November and tenable for 6 months. Preference given to candidates seeking post under the Medical Act, 1950.

Applications to Secretary, Mid-Herts Group Hospital Management Committee, Bleak House, Catherine-street, St. Albans.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time NON-RESIDENT SENIOR REGISTRAR in Orthopædics (transitional appointment) required. Main duties at the Nottingham City Hospital with duties also at the Children's and General Hospitals. Appointment for 1 year in first instance. Applications invited from Senior Registrars in Orthopædics in their fourth or subsequent years and from those who held such posts for 3 years or more but vacated them after 1st January, 1951.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 12th November, 1956, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

SHEFFIELD REGIONAL HOSPITAL BOARD. Victoria HOSPITAL, MANSFIELD (302 Beds. Recognised for the D.Obst. R.C.O.G.), KING'S MILL HOSPITAL, SUTTON-IN-ASHFIELD (172 Beds. Recognised for the M.R.C.O.G. Gynæcology). Whole-time RESIDENT REGISTRAR (obstetrics and gynæcology) required. Married accommodation available at Victoria Hospital. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 5th November, 1956, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

SHEFFIELD. THE UNITED SHEFFIELD HOSPITALS. Applications are invited for the following posts :—

(*a*) SURGICAL REGISTRAR. Post vacant 17th January, 1957. The successful candidate will work on a rotation basis between the Royal Infirmary and Children's Hospital. It is intended, if possible, that the holder of the post will spend equal periods in the Orthopædic Department and on each of the 2 surgical firms at the Royal Infirmary ; and for a period at the Children's Hospital.

Closing date for applications 3rd November, 1956.

(*b*) REGISTRAR or SENIOR HOUSE OFFICER in General Medicine at the Royal Infirmary. Grade according to qualifications and experience. Post vacant 3rd January, 1957. The successful candidate will work principally in the Professorial Unit (Therapeutics) at the above Hospital.

Closing date for applications 12th November, 1956.

(*c*) NON-RESIDENT REGISTRAR in Ophthalmology at the Royal Hospital.

Closing date for applications 12th November, 1956.

(*d*) RESIDENT SENIOR HOUSE OFFICER in Anæsthetics at the Royal Infirmary. Post vacant 9th January, 1957.

Applications to be sent at once.

Applications for the above posts should state age, qualifications and experience, give the names of 3 referees, and be sent to :—

For post (*a*), (*b*), and (*c*) : The Chief Administrative Officer, The United Sheffield Hospitals, Central Office, West-street, Sheffield, 1.

For post (*d*) : The Superintendent, Royal Infirmary, Sheffield, 6.

SHREWSBURY. ROYAL SALOP INFIRMARY. ORTHOPÆDIC/ACCIDENT HOUSE SURGEON (Senior House Officer). Successful applicant will be allowed to attend for 2 days a month at the Robert Jones and Agnes Hunt Orthopædic Hospital, Oswestry, for postgraduate study, with the Consultant. Post recognised under revised Fellowship regulations in respect of 6 months training required for the Final Fellowship examination. Vacant 1st November, 1956.

Applications, with copy testimonials, to Group Secretary, Shrewsbury Hospital Group, Royal Salop Infirmary, Shrewsbury.

SOUTH ELMSALL. WARDE-ALDAM HOSPITAL. Applications are invited for the post of RESIDENT SURGICAL OFFICER (Senior House Officer grade). Warde-Aldam Hospital is a general hospital of 39 Beds (general and orthopædic surgery and E.N.T.). Furnished flat available. The appointment is of attraction to Surgeons reading for Fellowship.

Applications, giving details of qualifications and previous experience, with names of 2 referees, to be forwarded to the undersigned as soon as possible.

D. G. DAVIES, Group Secretary.

Great Northern House, Salter-row, Pontefract, Yorks.

SOUTHAMPTON. ROYAL SOUTH HANTS HOSPITAL (274 Beds) and SOUTHAMPTON GENERAL HOSPITAL (472 Beds). SENIOR HOUSE OFFICER (E.N.T.) required immediately. This post is recognised for the F.R.C.S. (Eng.) and D.L.O. examinations and provides experience in all branches of E.N.T. work. The Group includes a diagnostic and distributing Hearing Aid Centre.

Applications, with copies of recent testimonials, should be forwarded as soon as possible, to the Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTHAMPTON GENERAL HOSPITAL. (472 Beds.) RESIDENT HOUSE PHYSICIAN required end November. Pre-registration candidates eligible.

Applications, with copies of testimonials, should be forwarded as soon as possible to the Group Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTHAMPTON GENERAL HOSPITAL. (472 Beds.) RESIDENT HOUSE SURGEON required mid-November. Pre-registration candidates eligible.

Applications, with copies of recent testimonials, should be forwarded to Group Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SCOTLAND. EASTERN REGIONAL HOSPITAL BOARD. ASHLUDIE HOSPITAL, MONIFIETH, DUNDEE. Thoracic Surgery. Applications are invited for the appointment of SENIOR REGISTRAR in Thoracic Surgery at Ashludie Hospital, Monifieth, near Dundee (222 Beds), which contains the Regional Thoracic Surgical Unit of 66 Beds for tuberculous and non-tuberculous cases. Higher surgical qualification and previous experience in thoracic surgery essential ; additional experience in general or chest medicine an advantage. Salary and conditions of service in accordance with National agreement.

Forms of application and further particulars from the Secretary to the Board, 430, Blackness-road, Dundee, with whom applications must be lodged not later than 17th November, 1956.

SCOTLAND. SOUTH-EASTERN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of REGISTRAR in Obstetrics and Gynæcology in the Edinburgh Northern Group of hospitals. The successful candidate will be required to reside at the Eastern General Hospital.

Applications, giving particulars of age, previous experience and qualifications, together with the names of 2 referees, should be sent to the Secretary, South-Eastern Regional Hospital Board, Scotland, 11, Drumsheugh-gardens, Edinburgh, 3, by 24th November.

SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD. Applications are invited for the following appointments, which will be for 1 year in the first instance :—

REGISTRAR in Surgery based at the Western Infirmary, Glasgow, and with duties at the Lewis Hospital, Stornoway.

REGISTRAR in Surgery based at the Southern General Hospital, Glasgow.

These appointments are subject to the National Health Service (Scotland) superannuation regulations.

Applications (12 copies), stating date of birth, qualifications, experience, present appointment, and the names of 3 referees, to reach the Secretary, Western Regional Hospital Board, 64, West Regent-street, Glasgow, C.2, by 10th November, 1956.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for an appointment as Whole-time REGISTRAR in Chest Diseases to fill a vacancy in the approved trainee establishment at Preston Hall Hospital, British Legion Village, Maidstone, Kent, available on 1st January, 1957. The appointment will be for work in general tuberculosis and will provide experience with a major surgical unit and also at chest clinics. Candidates must have had good experience in general medicine and in the diagnostic and treatment of pulmonary tuberculosis in adults. The appointment will be in accordance with the terms and conditions of service of hospital medical and dental staffs (England and Wales), and will be for 1 year in the first instance.

Applications, giving particulars of age, qualifications, and experience with relevant dates, together with the names and addresses of 2 referees, to be sent to the Secretary, Registrars Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, London, W.1, not later than 10th November, 1956.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for an appointment as Whole-time REGISTRAR in General Surgery to fill a vacancy in the approved trainee establishment at the Bromley, Kent Group of hospitals. The appointment will be in accordance with the terms and conditions of service of hospital medical and dental staffs (England and Wales), and will be for 1 year in the first instance.

Applications, giving particulars of age, qualifications, and experience with relevant dates, together with the names and addresses of 2 referees, to be sent to the Secretary, Registrars Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, London, W.1, not later than 10th November, 1956.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for an appointment as Whole-time ORTHOPÆDIC REGISTRAR with opportunity for general surgical work, in the Orpington and Sevenoaks Group of hospitals. The appointment will be in accordance with the terms and conditions of service of hospital medical and dental staffs (England and Wales), and will be for 1 year in the first instance.

Applications, giving particulars of age, qualifications, and experience with relevant dates, together with the names and addresses of 2 referees, to be sent to the Secretary, Registrars Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, London, W.1, not later than 10th November, 1956.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for 2 appointments as Whole-time REGISTRARS in Anæsthetics to fill vacancies in the approved trainee establishment at the following groups of hospitals respectively :—

(1) Brighton and Lewes.

(2) Dartford.

The appointments will be in accordance with the terms and conditions of service of hospital medical and dental staffs (England and Wales), and will be for 1 year in the first instance.

Applications, giving particulars of age, qualifications, and experience, with relevant dates, together with the names and addresses of 2 referees, to be sent to the Secretary, Registrars Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, London, W.1, not later than 10th November, 1956.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for an appointment as Whole-time SENIOR REGISTRAR in Plastic Surgery to fill a vacancy in the approved trainee establishment at the Tunbridge Wells Group of hospitals, for duty in the Plastic Surgery and Jaw Injuries Centre at the Queen Victoria Hospital, East Grinstead. Candidates should have had general surgical experience and be Fellows of a Royal College of Surgeons. The appointment will be in accordance with the terms and conditions of service of hospital medical and dental staffs (England and Wales), and will be for 1 year in the first instance.

Applications, giving particulars of age, qualifications and experience with relevant dates, together with the names and addresses of 3 referees, to be sent to the Secretary, Registrars Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, London, W.1, not later than 10th November, 1956.

SUTTON AND CHEAM HOSPITAL, Cotswold-road, SUTTON, SURREY. RESIDENT SENIOR HOUSE OFFICER (Casualty Officer). Post recognised for F.R.C.S.

Applications, stating age, qualifications and experience, with copies of recent testimonials and the names of 2 referees, to the Group Secretary, St. Helier Hospital, Carshalton, Surrey.

TAPLOW, near MAIDENHEAD. CANADIAN RED CROSS MEMORIAL HOSPITAL. HOUSE PHYSICIAN required for post vacant 2nd December. Preference given to persons seeking pre-registration post.

Applications, stating age, experience and qualifications with dates, together with copies of 2 testimonials, to Secretary.

TAUNTON AND SOMERSET HOSPITAL. Applications are invited for SENIOR HOUSE OFFICER (casualty and orthopædic), vacant from 9th December, 1956.

Applications, stating age, nationality and qualifications, together with the names of 2 referees, should be forwarded to the Group Secretary, Taunton Hospital Management Committee, Taunton and Somerset Hospital, Musgrove Park Branch, Taunton, Somerset.

TAUNTON AND SOMERSET HOSPITAL. Applications are invited for the post of HOUSE OFFICER (E.N.T.), vacant 5th November, 1956. Post-registration appointment, recognised for F.R.C.S. and D.L.O.

Applications, stating age, nationality and qualifications, together with the names of 2 referees, should be forwarded immediately to the Group Secretary, Taunton Hospital Management Committee, Taunton and Somerset Hospital, Musgrove Park Branch, Taunton, Somerset.

VENTNOR, I. of W. ROYAL NATIONAL HOSPITAL FOR DISEASES OF THE CHEST. (240 Beds.) Required, RESIDENT JUNIOR HOSPITAL MEDICAL OFFICER, post vacant end December. Hospital has all facilities for major thoracic surgery.

Applications, with names of 2 referees, to Physician-Superintendent.

WAKEFIELD. STANLEY ROYD HOSPITAL. Applications invited for post of JUNIOR HOSPITAL MEDICAL OFFICER in Psychiatry. Salary scale £775–£50–£1075. Married accommodation may be available.

Address written applications, giving full personal particulars, details of training, experience, &c., together with 2 names and addresses for reference, to W. BOWRING, Group Secretary.

Victoria Chambers, Wood-street, Wakefield.

WELWYN GARDEN CITY MATERNITY HOSPITAL AND ST. ALBANS CITY HOSPITAL. NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Whole-time GYNÆCOLOGICAL AND OBSTETRIC REGISTRAR required for duties mainly at Welwyn Garden City Maternity Hospital (30 Beds). It is hoped to provide suitable accommodation within easy reach of the Hospital for a single or married candidate. Hospitals may be visited by direct appointment.

Application forms obtainable from, and returnable to, Secretary, Mid Herts Group Hospital Management Committee, Bleak House, Catherine-street, St. Albans, Herts, by 6th November, 1956.

WELSH REGIONAL HOSPITAL BOARD. Registrar in Infectious Diseases. Based City Isolation Hospital, Cardiff (219 Beds). To serve Cardiff Hospital Management Committee. Resident/non-resident. Subject to review end of first year.

Application forms from Senior Administrative Medical Officer, Temple of Peace, Cathays Park, Cardiff, within 14 days.

WELSH REGIONAL HOSPITAL BOARD.

REGISTRAR (orthopædic) Royal Gwent Hospital, Newport. Separate Fracture and Orthopædic Unit (36 Beds). Own Outpatient, X-ray and Rehabilitation Departments. Non-resident.

REGISTRAR in General Medicine, based at Royal Alexandra Hospital, Rhyl (138 Beds). May be required to visit other hospitals in Clwyd and Deeside Hospital Management Committee area. Non-resident.

SENIOR REGISTRAR (obstetrics and gynæcology), Morriston Hospital, Swansea. Hospital recognised for M.R.C.O.G. Subject to review end of first year.

Application forms from Senior Administrative Medical Officer, Temple of Peace, Cathays Park, Cardiff, within 14 days.

WESTON-SUPER-MARE GENERAL HOSPITAL. CASUALTY OFFICER (Senior House Officer grade) required 1st November, 1956, for the above Hospital. The appointment is recognised for F.R.C.S. examinations. An unfurnished flat is available for a married man.

Applications, stating age, qualifications and experience, together with the names and addresses of 2 referees, should be addressed to the Group Secretary, Weston-super-Mare Hospital Management Committee.

WIGAN (near). WRIGHTINGTON HOSPITAL. Junior HOSPITAL MEDICAL OFFICER required (resident or non-resident). Manchester Regional Centre for orthopædic tuberculosis. 200 adults and 100 children. Salary £775–£50–£1075 p.a.

Apply to Secretary with 2 references.

WHITEHAVEN HOSPITAL, Cumberland. (124 Beds and Annexe of 27 Beds.) HOUSE OFFICER (obstetrical and gynæcological). House Officer or Senior House Officer grade, vacant middle of November.

Detailed applications, with dates, and names of 2 referees, to the Group Secretary, Workington Infirmary, Cumberland.

WINCHESTER. ROYAL HAMPSHIRE COUNTY HOSPITAL. (313 Beds.) HOUSE SURGEON (post recognised by Royal College of Surgeons) required for general surgery with some E.N.T. duties. Approved pre-registration post. Vacant 1st December.

Applications, with copies of 2 testimonials, to the Group Secretary.

WINDSOR GROUP OF HOSPITALS. Plastic Surgical REGISTRAR required. Either resident (at Canadian Red Cross Memorial Hospital) or non-resident. Successful candidate will also be expected to attend the main Plastic Centre at Mount Vernon Hospital, Northwood. Duties will include the care of all plastic surgical cases, related accident cases and hand injuries.

Application forms obtainable from, and returnable to, Secretary, Windsor Group Hospital Management Committee, Alma-road, Windsor, by 4th November.

WINDSOR. KING EDWARD VII HOSPITAL. House SURGEON in General and Orthopædic Surgery, required. Male or Female, for post vacant 19th December. Recognised for F.R.C.S. Preference given to persons seeking pre-registration post. Applicants required to be members of Medical Protection Society.

Applications, stating age, qualifications with dates, nationality, with copies of recent testimonials, to Secretary.

WINDSOR. KING EDWARD VII HOSPITAL. House SURGEON in General Surgery required, Male or Female, for post vacant 1st January. Preference given to persons seeking pre-registration post. Recognised for F.R.C.S. Applicants required to be members of a Medical Protection Society.

Applications, stating age, nationality, qualifications with dates, with copies of recent testimonials, to Secretary.

WINDSOR. KING EDWARD VII HOSPITAL. House PHYSICIAN (pædiatrics) required, Male or Female, for post vacant end of December. Preference given to persons seeking a pre-registration post. Hospital recognised for D.C.H. Successful candidate will be resident at Old Windsor Unit of Hospital. Applicants required to be members of a Medical Protection Society.

Applications, stating age, nationality, qualifications with dates, and experience, with copies of 3 testimonials, to Secretary.

WINDSOR. KING EDWARD VII HOSPITAL. House PHYSICIAN required, Male or Female, for post vacant 15th December. Preference given to persons seeking pre-registration post. Applicants required to be members of Medical Protection Society.

Applications, stating age, qualifications with dates, nationality and copies of 3 recent testimonials, to Secretary.

WOLVERHAMPTON. NEW CROSS HOSPITAL. (627 Beds.) SENIOR HOUSE PHYSICIAN (general medicine) required immediately.

Apply to Secretary by 5th November.

WOLVERHAMPTON. THE ROYAL HOSPITAL. (Associated Hospital of Birmingham University Medical School.) SENIOR HOUSE OFFICER (thoracic surgery and thoracic medicine). New post for duties in thoracic surgical ward opening shortly and the Chest Clinic, Wolverhampton. Vacant 1st December. Good basic experience.

Applications to Hospital Secretary.

WORKSOP. KILTON HOSPITAL. (190 Beds.) Sheffield REGIONAL HOSPITAL BOARD. Whole-time RESIDENT MEDICAL REGISTRAR required. Post vacant 1st January, 1957. Appointment for 1 year in the first instance. The Kilton Hospital contains the medical division of the Worksop Group, which includes 42 acute medical beds, some 50 geriatric, 15 pædiatric and 4 dermatological beds. There are 2 House Physicians on the establishment.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 5th November, 1956, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

WORTHING HOSPITAL, Lyndhurst-road, Worthing, SUSSEX. (210 Beds.) Applications are invited for the whole-time post of MEDICAL REGISTRAR with duties in the General Medical Wards and Pædiatric Unit. The post will be vacant from 8th December, 1956.

Forms of application are available from the undersigned.

A. V. OAKTON, Group Secretary,
Worthing Group Hospital Management Committee.
129, Brighton-road, Worthing, Sussex.

YEOVIL HOSPITAL, Somerset. Applications are invited for the post of RESIDENT SENIOR HOUSE OFFICER (surgical). Yeovil is the main general hospital of a Group and affords good all-round practical experience. Salary £745 p.a.

Applications, giving age, experience, qualifications, nationality, and names of 3 referees, to be sent to the Group Secretary, South Somerset Hospital Management Committee, 71, Higher-kingston, Yeovil.

DUBLIN. NATIONAL B.C.G. COMMITTEE. St. Ultan's HOSPITAL, 37, Charlemont-street, DUBLIN. Applications are invited for post of VACCINATOR to the above Committee. Applicants must be medical practitioners registered in Ireland, under 40 years of age, and must have had special experience in tuberculosis work as Assistant Tuberculosis Officer and as Assistant Resident Medical Officer in a sanatorium or chest hospital. Salary £1176 p.a. and travelling expenses.

Application forms obtainable from Medical Director at above address. Completed application forms must be received on or before Saturday, 10th November, 1956.

MULLINGAR. COUNTY HOSPITAL. Resident Medical OFFICER required at above Hospital for a period of 6 months, subject to extension. Salary £325–£475 by half-yearly increments of £50. A temporary bonus at the rate of 10% on the first £300 and 6½% on the portion of salary over £300 is at present payable, less a deduction of £9 p.a. towards the cost of rations and apartments which are provided. Credit will be given for previous service in a recognised hospital.

Applications should be lodged with the County Secretary, Westmeath County Council, County Buildings, Mullingar, as soon as possible.

B.W.I. UNIVERSITY COLLEGE HOSPITAL OF THE WEST INDIES. Applications are invited for the following post-registration appointments at the above-named Teaching Hospital of 301 Beds approved by the University of London for its degrees :—

(1) 2 SENIOR CASUALTY OFFICERS for Medical and Surgical Casualty Departments. Applicants should have been qualified for a minimum of 2 years. Appointments are for 6 months commencing 1st January and 1st July, 1957, and salary is payable at the rate of £850 p.a., less a deduction of £145 p.a. in respect of single accommodation and board.

(2) MEDICAL CASUALTY OFFICER from 1st January and 1st July, 1957.

(3) SURGICAL CASUALTY OFFICER from 1st July, 1957.

(4) RESIDENT ANÆSTHETIST from 1st July, 1957.

(5) 2 RELIEVING (Rotating) HOUSE OFFICERS from 1st January and 1st July, 1957.

(6) Required immediately : SURGICAL CASUALTY OFFICER and 2 HOUSE OFFICERS for relieving duties in different departments—the appointments to be continuous with the above posts.

Salaries for these posts are payable at the rate of £750 p.a., less a deduction of £145 p.a. for single accommodation and board.

Return first-class passages paid for 1 person only in respect of each contract. Contracts will extend for 12 months, and consist of 2 posts of 6 months each for candidates appointed from outside Jamaica.

Further information may be obtained from the Hospital Manager and Secretary, University College Hospital, Mona P.O. Jamaica, B.W.I., to whom applications stating age, nationality, details of qualifications, and experience, together with 3 recent testimonials or the names and addresses of 3 referees, and stating posts preferred in order of preference, should be sent immediately.

CANADA. GRACE HOSPITAL, Winnipeg, Manitoba, CANADA, has vacancies for RESIDENCIES and SENIOR INTERNSHIPS. Salary $150 per month, plus room and board. Uniforms and laundry provided. Grace Hospital is an active general hospital of 230 Beds with approximately 9128 discharges per year.

Applicants with credentials are invited.

Public Appointments

BECHUANALAND PROTECTORATE. Medical Officers with qualifications registrable in United Kingdom required for general medical, surgical, and obstetrical duties. 2 years post-graduate experience and ability to do general surgery desirable but not essential.

Appointment can be on 2 years probation to the pensionable establishment ; or on 36 months contract with gratuity (taxable) assessed at £25 (when salary is below £1000 a year) or £37 10s. (when salary above £1000 a year) for each completed period of 3 months service. Salary £940–£1515 a year ; starting point determined by age and experience. Following non-pensionable allowances payable :—

(a) Cost-of-living allowance of 12% salary up to maximum of £132 a year for married officers and half this rate for single officers.

(b) Special allowance of £60 a year for married officers and £30 for single officers.

(c) Education allowance of £50 for each child (up to maximum of 3 children) provided for children's education outside territory.

Private practice permitted, which varies from station to station.

Quarters and heavy furniture provided at low rental. Free passages for Officer and wife and passage allowance for children. Local leave permitted and generous home leave granted after each tour of 24–30 months. Income-tax at local rates which are low.

Application forms from Director of Recruitment, Colonial Office, London, S.W.1 (quoting No. BCD.117/76/02).

DURHAM. ADMINISTRATIVE COUNTY OF DURHAM. BOROUGH OF HARTLEPOOL. Applications are invited from duly qualified medical practitioners (Women) holding a Degree or Diploma in Sanitary Science, Public Health, or State Medicine for the separate appointments of ASSISTANT WELFARE MEDICAL OFFICER (Maternity and Child Welfare) and MEDICAL OFFICER OF HEALTH for the Municipal Borough of Hartlepool. The total salary payable will be £1241 7s. 3d., rising by 3 increments of £53 3s. 8d., 1 increment of £57 10s. and 4 increments of £47 10s., to £1648 8s. 3d. p.a. The appointments will be superannuable. Canvassing directly or indirectly will disqualify and applicants must disclose whether they are related to any member or senior officer of the employing authorities.

Further particulars of the appointments and form of application may be obtained from the undersigned. Applications, giving the names of 3 persons to whom reference may be made, should be sent to the Clerk of the County Council not later than 10th November, 1956.

J. K. HOPE, Clerk of the County Council.

Shire Hall, Durham.

L. O. WILLIAMS, Town Clerk.

Town Clerk's Office, Hartlepool.

FACTORY DOCTORS. Factories Acts, 1937 and 1948 The following appointments as Appointed Factory Doctor are vacant. Apply to Chief Inspector of Factories, 19, St. James's square, London, S.W.1.

District	*County*	*Latest date for receipt of applications*
DUNS	BERWICK	10TH NOVEMBER, 1956
NEW MILLS	DERBY	10TH NOVEMBER, 1956
KENDAL	WESTMORLAND	17TH NOVEMBER, 1956

GATESHEAD. COUNTY BOROUGH OF GATESHEAD. ASSISTANT MEDICAL OFFICER OF HEALTH AND SCHOOL MEDICAL OFFICER (Female). Applications are invited from duly qualified medical practitioners (Female) in possession of the D.P.H., C.P.H., or D.C.H., for the post of Assistant Medical Officer in the Public Health Department. Salary will be within the scale commencing £1050–£50–£1200–£55–£1475 p.a., having regard to the experience of the candidate in similar posts. The appointment is superannuable, subject to medical examination, and is terminable by 1 months notice from either side.

A list of the duties of the office may be obtained from the Medical Officer of Health, Greenesfield House, Mulgrave-terrace, Gateshead, to whom applications, stating age and experience and accompanied by not more than 3 recent testimonials should be sent in envelopes endorsed "Assistant Medical Officer," within 14 days of the appearance of this advertisement.

C. D. JACKSON, Town Clerk.

Town Hall, Gateshead, 8, 9th October, 1956.

GOLD COAST LOCAL CIVIL SERVICE. Ministry of HEALTH. RADIOLOGISTS required to take charge of Hospital X-ray Departments and train junior staff as X-ray attendants. Candidates must possess D.M.R.D.

Appointment is to Gold Coast Local Civil Service and may be :

(a) Contract for 2 tours of duty of 18–24 months with gratuity (taxable) of £12 10s. for each completed month of service.

(b) 3 years probation for permanent and pensionable employment. Pension (non-contributory) at rate of 1/600th of final pensionable emoluments for each completed month of service: or

(c) Doctors in the National Health Service may leave the National Health Service but retain their superannuation rights while in the Gold Coast (up to 6 years) and receive a gratuity (taxable) of 20% of their Gold Coast salary.

Salary under (a) from £1330 to £2310 a year, and under (b) and (c) £1055 to £1850 a year, starting point being determined by qualifications and experience. Temporary addition of £29 15s. a year also payable.

Quarters at rental not exceeding £150 a year. Income-tax at local rates. Free passages for Officer, wife, and up to 3 children under 13 years of age. Annual local leave permissible and generous home leave granted after each tour.

Application forms from Director of Recruitment, Colonial Office, London, S.W.1 (quoting No. BCD.117/13/07).

HEREFORDSHIRE COUNTY COUNCIL. Applications are invited from registered medical practitioners possessing a Diploma in Public Health for the whole-time appointment of ASSISTANT COUNTY MEDICAL OFFICER AND MEDICAL OFFICER OF HEALTH for the Leominster Borough, Bromyard Urban, Kington Urban, Leominster and Wigmore Rural, Bromyard Rural, Kington Rural and Weobley Rural District Councils. Salary scale : £1576 5s. 0d.–£58 15s. 0d. (3)–£61 17s. 6d. (1)–£34 7s. 6d. (4)–£1951 17s. 6d. p.a. The person appointed must provide and use his own car in consideration of a travelling allowance in accordance with the recommendations of Committee "C" of the Medical Whitley Council.

Applications on the prescribed form, which with full particulars may be obtained from the County Medical Officer, 35, Bridge-street, Hereford, must be received by him within 14 days from the publication hereof.

R. C. HANSEN, Clerk of the County Council.

HUDDERSFIELD. COUNTY BOROUGH OF HUDDERSFIELD. Applications are invited from duly qualified medical practitioners for the appointment of MEDICAL OFFICER OF HEALTH AND SCHOOL MEDICAL OFFICER of the County Borough of Huddersfield at a salary of £2070, rising by 5 annual increments to £2340 (in accordance with the incremental scale of the Whitley Council for the Health Services Committee C). There is a car allowance of £131 p.a. Applicants must possess a Diploma in Public Health or a similar qualification and should have had experience in the administration of the Public Health and School Medical Services. The person appointed will be required to reside in the Borough, to devote the whole of his time to the duties of the office, and not to engage in private practice. The appointment is subject to the provisions of the appropriate superannuation act, to the passing of a medical examination and to termination by 3 months written notice on either side.

Applications, stating age, qualifications and experience, accompanied by 3 recent testimonials and endorsed "Medical Officer of Health," must reach me not later than Tuesday, 6th November, 1956.

Town Hall, Huddersfield. HARRY BANN, Town Clerk.

NATIONAL COAL BOARD. North-Eastern Division Applications are invited for 2 posts of ASSISTANT AREA MEDICAL OFFICER in No. 1 (Worksop) Area and No. 3 (Rotherham) Area. Candidates should preferably be aged about 30 years and have experience in the field of preventive and industrial medicine and a knowledge of the Coal-mining Industry will be an advantage. The work will include making underground visits at collieries. Salary according to qualifications and experience will be within the range of £1100–£1600 p.a. Candidates with a fair amount of postgraduate experience will not be paid less than £1200.

Detailed applications, giving the names of 2 referees, should be sent to the Staff Director, National Coal Board, North-Eastern Division, Holmwood House, Ecclesall-road South, Sheffield, 11, to arrive not later than 3rd November, 1956.

GOVERNMENT OF THE EASTERN REGION OF NIGERIA. SPECIALIST (Orthopædic Surgeon) required in Leprosy Service of the Eastern Region of Nigeria to undertake orthopædic and plastic surgery at leprosy settlements, each of which has small hospital of 60–100 Beds with operating theatre and laboratory, and to demonstrate to medical officers modern methods in plastic surgery in maimed and deformed leprosy patients. Appointment on contract for 1 year in first instance with possibility of further 1 year tour thereafter. Salary £2442 a year and a gratuity (taxable) on completion of satisfactory engagement of £37 10s. for each completed period of 3 months service (including leave).

Quarters provided at low rental. Taxes at local rates. Annual local leave permissible ; generous home leave granted after each tour. Free return passages for Officer and wife ; and, when appropriate either (but not both) of the following in any 1 tour of service :—

(*a*) 1 return sea passage for each of 2 children under age of 18 subject to maximum of £75 in respect of the return journey for each child, or

(*b*) An allowance of £75 a year for each of 2 children under age of 18 maintained outside Nigeria for whole of tour.

Candidates must be Fellow of a Royal College of Surgeons or have higher degree in orthopædics and experience in orthopædic and plastic surgery.

Application forms from Director of Recruitment, Colonial Office, London, S.W.1 (quoting No. BCD. 117/411/04).

LANCASHIRE COUNTY COUNCIL. Applications are invited from registered medical practitioners for appointment as ASSISTANT DIVISIONAL MEDICAL OFFICERS. Vacancies in Stretford/Urmston, Fylde, and in the vicinity of Wigan, Bolton, Liverpool/St. Helens, Manchester/Oldham. Possession of Diploma in Public Health desirable. Salary £1050 rising to £1475 p.a. Travelling and subsistence allowances.

Application forms and further particulars from County Medical Officer, Serial 889, East Cliff County Offices, Preston, to be returned by 3rd November, 1956.

AMENDED ADVERTISEMENT

LINCOLN. COUNTY OF LINCOLN—PARTS OF LINDSEY. ASSISTANT COUNTY MEDICAL OFFICER AND MEDICAL OFFICER OF HEALTH for the Barton-on-Humber and Brigg Urban and the Glanford Brigg Rural Districts. Applications are invited from registered medical practitioners with experience in public health work and holding a Diploma in Public Health, Sanitary Science or State Medicine for the above whole-time mixed appointment. The salary which is in accordance with recommendations of the Medical Whitley Council Committee C as adopted by the County Council will commence at £1683 14s. 11d. p.a. and will rise by 3 annual increments of £58 14s. 11d. 1 of £61 17s. 5d., 4 of £34 7s. 7d., to a maximum of £2059 7s. 5d., and the officer appointed will be placed on the appropriate step of the scale having regard to his experience. The appointment will be subject to the Local Government Superannuation Acts, 1937 and 1953.

Forms of application and further particulars obtainable from the Clerk of the County Council, County Offices, Lincoln, to whom completed applications must be returned not later than 23rd November, 1956.

H. COPLAND, Clerk of the Lindsey County Council.
Lincoln.

MANCHESTER EDUCATION COMMITTEE. Required, Part-time PSYCHIATRIST at the Child Guidance Clinic, to work 5 sessions (or less) per week. Candidates should hold D.P.M. and have recognised training in child psychiatry. Salary £4 4s. per session.

Application form and further particulars from Chief Education Officer, P.O. Box 480, Manchester, 3, returnable by 10th November.

MERTHYR TYDFIL. COUNTY BOROUGH OF MERTHYR TYDFIL. Applications are invited from Male registered medical practitioners for the appointment of SCHOOL MEDICAL OFFICER AND ASSISTANT MEDICAL OFFICER OF HEALTH. Candidates must possess the Diploma in Public Health. Salary scale £1050–£50–£1200–£55–£1475. The appointment will be subject to the local Government superannuation acts.

Applications should be sent to the undersigned by Monday, 12th November, 1956.

T. H. STEPHENS, Medical Officer of Health and Principal School Medical Officer.
Department of Public Health, Town Hall, Merthyr Tydfil, Glam.

PORTSMOUTH. CITY OF PORTSMOUTH. Applications are invited for the appointment of SCHOOL MEDICAL OFFICER AND ASSISTANT MEDICAL OFFICER OF HEALTH. The duties of the appointment will include school eye clinic work (refraction) on behalf of the South West Metropolitan Hospital Board. Preference will be given to applicants possessing special knowledge and experience in school medical work and the diseases of children, particularly in ophthalmic work for which appropriate qualifications are essential. The salary and conditions of service are those of the Whitley Council for the Health Services (Great Britain) Medical Council "C."

Application forms may be obtained from the Chief Education Officer, 1, Western-parade, Portsmouth, to whom they should be returned within 14 days of the appearance of this advertisement.

V. BLANCHARD, Town Clerk.

WORCESTERSHIRE COUNTY COUNCIL. Assistant COUNTY MEDICAL OFFICER OF HEALTH (Worcestershire) MEDICAL OFFICER OF HEALTH (Evesham Borough and Evesham and Pershore Rural Districts). Applications are invited from registered medical practitioners with D.P.H for this combined appointment. Salary between minimum of £1475 and maximum of £1860 p.a.

Application forms, with details from County Medical Officer County Buildings, Worcester. (O.183.)

GLASGOW. CORPORATION OF GLASGOW. Assistant MEDICAL OFFICER (Mental Services). Applications are invited from registered medical practitioners for appointment in the Health and Welfare Department for duties relating to mental defectives and certification of mental patients. Salary scale £1050–£50 (3)–£55 (5)–£1475 p.a. The post is superannuable, subject to medical examination.

Applications, stating age, qualifications, and experience, with names of 3 referees, should be lodged with me and marked "Appointment—Assistant Medical Officer, Mental Services," by 7th November, 1956.

City Chambers, Glasgow. WILLIAM KERR, Town Clerk.

General Practice

Assistant with view, required shortly ; outstanding opportunity for applicant with sense of vocation ; interest in original work an advantage ; full particulars please.—Address, No. 254, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Hospital Services : Non-Medical Appointments

ST. THOMAS'S HOSPITAL MEDICAL SCHOOL, London, S.E.1. LABORATORY TECHNICIAN qualified in Biochemistry or Chemical Pathology required for Department of Chemical Pathology.

Write, giving full details, age, qualifications, and experience, to Finance Officer.

OXFORD. UNITED OXFORD HOSPITALS. Applications invited from suitably qualified candidates for post of BIOCHEMIST (Senior grade) at the Radcliffe Infirmary, Oxford. The applicant appointed will work under the Director of the Department of Clinical Biochemistry, from whom further information may be obtained. Salary, &c., in accordance with Whitley Council scale (rising to maximum of £1230 p.a.).

Applications, together with names and addresses of 2 referees, should be sent to the Administrator, Radcliffe Infirmary, Oxford, not later than 10th November, 1956.

GOLD COAST. TEMA HOSPITAL require Deputy MATRON. Salary £1000 p.a., 18 month tours. 3 months leave on full pay. House with hard furnishings provided. Kit allowance £60.

Applications, with full personal particulars and details of training and posts held, to Box L.209, L.P.E., 55, St. Martin's-lane, W.C.2.

Miscellaneous

The Middlesex Local Medical Committee invites applications to fill the vacant post of Secretary to the Committee. Applicants must be registered medical practitioners with experience of general practice under the National Health Service. Applicants should be familiar with Committee procedure and have an intimate knowledge of those parts of the National Health Service Acts and Regulations that relate to general practice. The successful candidate will be required to enter into a contract of service with the Committee, and may be required to undergo a medical examination and join a superannuation scheme. Salary scale : £2250–£100–£2750. (The point of entry into the scale will be determined by the qualifications and experience of the successful candidate.) Further particulars will be available on application to the Office of the Committee.

Applications, giving all material information and enclosing the names of 2 referees, with the envelope endorsed "Secretary," should be addressed to the Chairman, Middlesex Local Medical Committee, Tavistock House North, Tavistock-square, London, W.C.1, before 16th November next.

Administrative Officer is required as Personal Assistant to the Director of Research and Development in a Pharmaceutical Company located near London. This Directorate is in process of expansion and requires a man with organisational ability and experience, capable of taking the fullest responsibilities for non-technical functions of the Directorate. Qualifications : University degree, age 30–45, some medical-scientific background and association desirable. Salary £1500–£2000 dependent on age and experience.—Address, No. 255, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

The Crookes Laboratories Ltd., Gorst-road, Park Royal, N.W.10, invite applications for the post of Manager of their Medical Department. A medical degree, ability to control clinical research and an aptitude for writing medical literature are essential. The appointment is one of high responsibility.—Applications to G. E. WATSON, Director/General Manager.

Personable S.R.N. desires scope for versatility and social sense in work as nurse/receptionist to 1 or more doctors. Gold medallist. Typist. Surgeons' references.—Address, No. 253, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

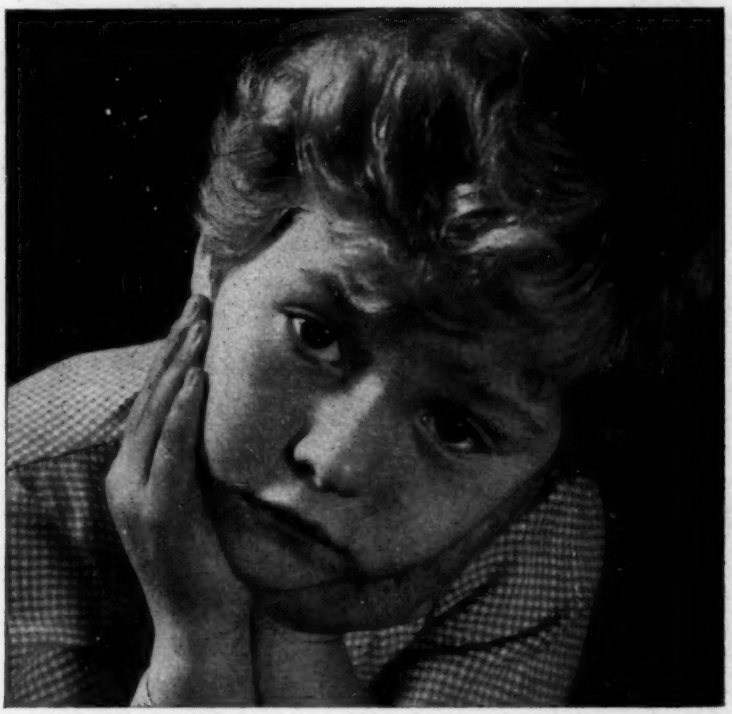
Receptionist (50) available in London 2 days a week. Pleasant exterior, human on the telephone. Typing adequate, knowledge of book-keeping inadequate. Likes people.—Address, No. 257, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

"Pregnancy Diagnosis by the Xenopus Method," 24-hour service. Send specimen of urine and £1 1s. fee. Hæmatology, Biochemistry, Flame Photometry.—WELBECK BIOLOGICAL LABORATORIES, 26, Park-crescent, Portland-place, W.1 (MUSeum 5386–7).

Applicants for posts requiring testimonials copied or duplicated should communicate with MANTON SECRETARIAL SERVICE LTD., 98, Victoria-street, S.W.1 (Phone : VICtoria 0141), who are specialists in this kind of work.

Typewriting and Duplicating. First-class work at moderate prices by experienced medical typists. Electric machines.—SYBIL RANG, 21, Heath-street, Hampstead, London, N.W.3 (HAM 5329/0504).

PUBLISHED by the PROPRIETORS, THE LANCET LIMITED, 7, Adam Street, Adelphi, in the County of London.
Printed by HAZELL, WATSON & VINEY, LTD., London and Aylesbury—Saturday, October 27, 1956.
PRINTED IN GREAT BRITAIN—Entered as Second Class at the New York, U.S.A., Office.



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On the other hand, most children will readily take aspirin in the form of *Junior Paynocil*. These tablets are really pleasant to take; they disperse instantly on the tongue without water, and minimise the risk of gastric irritation due to aspirin.

Junior Paynocil tablets each contain 2½ grains of aspirin and 1¼ grains of glycine. Besides speeding disintegration and eliminating the unpleasant aspirin flavour, glycine confers on each aspirin particle a lubricant, demulcent and protective barrier.

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Packages

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Tax free dispensing packs of 240.

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C. L. BENCARD LTD., PARK ROYAL, LONDON N.W.10

Just the right combination

Cold, damp and smoke—just the right combination to produce the fog which sets people coughing and sends them to their doctor in search of relief.

And the relief is readily available with the M&B brand cough linctus 'Phensedyl', which contains promethazine for its prolonged antihistamine, local analgesic and central sedative action, ephedrine for its broncho-dilator activity and codeine for its depressant effect on the cough reflex. Whatever the cause of cough — whether it is "smog", smoking, the aftermath of influenza, or a more serious condition — these properties of 'Phensedyl' usually bring relief. They provide the right combination.

Supplied in bottles of 4 and 40 fl. oz. Each 3.6 c.c. (*approximately 1 teaspoonful*) contains:

Promethazine Hydrochloride B.P. 3.6 mgm.
Codeine Phosphate B.P..... 9 mgm.
Ephedrine Hydrochloride B.P. ... 7,2 mgm.

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